Construction Document Submission - Specifications

for the proposed new facility at

Ohio Department of Transportation
District 8
Preble County
Full-Service Maintenance Facility

Volume 01
Divisions 00 - 14
October 17, 2025

BURGESS & NIPLE KZF DESIGN
joint venture

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State of Ohio Standard Requirements for Public Facility Construction

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END OF DOCUMENT

Document 00 10 00 - Solicitation (General Contracting / Electronic Bid)
State of Ohio Standard Requirements for Public Facility Construction

Electronic bids will be received by:

Ohio Facilities Construction Commission
https://bidexpress.com

for the following Project:

Project DOT - 200011
Preble County Full Service Maintenance Facility
Ohio Department of Transportation
234 Quaker Trace Rd.
West Alexandria, OH 45381

in accordance with the Contract Documents prepared by:

B&N / KZF Joint Venture, LLC
700 Broadway Street
Cincinnati, OH 45202
513-535-9731
Chad R. Kohler
Chad.Kohler@BurgessNiple.com
513-535-9731

In compliance with Section 153.08 of the Ohio Revised Code and Section 153:1-8-01 of the Ohio Administrative Code, Bids for this Project are being received, opened, and published through electronic means using the State's electronic bidding service.

To access this Project through the electronic bidding service, you must first register at https://bidexpress.com by clicking on the "REGISTER FOR FREE" button and following the instructions. In order to bid, you must create and enable a digital ID within the service. This process requires the submission of notarized paperwork and may take up to five business days to complete. There are no fees to register, create and enable a digital ID, or to download bid documents. There is a small expense on a monthly or per bid basis to submit a bid. The electronic bidding service offers customer support that may be reached at 888.352.2439 or via email at support@bidexpress.com.

Bidders may submit requests for consideration of a proposed Substitution for a specified product, equipment, or service to the Architect/Engineer ("A/E") no later than 10 days prior to the bid opening. Additional products, equipment, and services may be accepted as approved Substitutions only by written Addendum.

From time to time, the Commission issues new editions of the "State of Ohio Standard Requirements for Public Facility Construction" and may issue interim changes. Bidders must submit Bids that comply with the version of the Standard Requirements included in the Contract Documents.

Prevailing Wage rates and Equal Employment Opportunity requirements are applicable to this Project.

This Project is subject to the State of Ohio's Encouraging Diversity, Growth, and Equity ("EDGE") Business Development Program. A Bidder is required to submit with its Bid and with its Bidder's Qualifications form, certain information about the certified EDGE Business Enterprise(s) participating on the Project with the Bidder. Refer to **Section 6.1.10** of the **Instructions to Bidders**.

The EDGE Participation Goal for the Project is **5.0 percent**.

For more information about EDGE certification, contact the State of Ohio, Department of Development, Minority Business Division at www.minority.ohio.gov or email certifications@development.ohio.gov.

The Bidder may be subject to a Pre-Award Affirmative Action Compliance Review in accordance with Section 123:2-5-01 of the Ohio Administrative Code including a review of the Bidder's employment records and an on-site review.

The Bidder must indicate on the electronic Bid Form, the locations where its services will be performed in the spaces provided or by attachment in accordance with the requirements of Executive Order 2019-12D related to providing services only within the United States and the requirements of Executive Order 2022-02D prohibiting purchases from or investment in any Russian institution or company. Failure to do so may cause the Bid to be rejected as non-responsive.

DOMESTIC STEEL USE REQUIREMENTS AS SPECIFIED IN OHIO REVISED CODE SECTION 153.011 APPLY TO THIS PROJECT. COPIES OF OHIO REVISED CODE SECTION 153.011 CAN BE OBTAINED FROM ANY OF THE OFFICES OF THE OHIO FACILITIES CONSTRUCTION COMMISSION.

Bidders are encouraged to be enrolled in and to be in good standing in a Drug-Free Safety Program ("DFSP") approved by the Ohio Bureau of Workers' Compensation ("OBWC") prior to submitting a Bid and provide, on the Electronic Bid Form with its Bid, certain information relative to their enrollment in such a program; and, if awarded a Contract, shall comply with other DFSP criteria described in **Section 1.6** of the **General Conditions**.

Electronic bids will be received for:

Trade	Estimate
General Contract	**$13,560,000.00**
Alternate 1	**$30,750**
Alternate 2	**$49,200**

until **December 4th, 2025**, at **2:00 p.m.**, when all Bids will be electronically opened. Bid tabulations will be posted no later than 5:00 p.m. on the day Bids are opened.

All Bidders are strongly encouraged to attend the Pre-Bid Meeting on **November 18th, 2025**, at **1:00 p.m.** until approximately **2:00 p.m.**, at the following location: 234 Quaker Trace Rd., West Alexandria, OH 45381

The Contractor is responsible for scheduling the Project, coordinating the Subcontractors, and providing other services identified in the Contract Documents.

The Contract Documents may be downloaded as electronic PDF files from the State's electronic bidding service at https://bidexpress.com at no charge.

END OF DOCUMENT

Document 00 21 13 - Instructions to Bidders (General Contracting / Electronic Bid)
State of Ohio Standard Requirements for Public Facility Construction

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ARTICLE 1 - GENERAL INSTRUCTIONS

1.1 Applicable Law and Forum

1.1.1 The rights of any Bidder or any party to a subsequent Contract shall be governed by the laws of the state of Ohio and only Ohio courts shall have jurisdiction over any action or proceeding related to the Bid or any subsequent Contract. The Bidder irrevocably consents to such jurisdiction.

1.2 Project Scheduling and Coordination

1.2.1 When the Contract Documents refer to a period of time by a number of days, it excludes the first day and includes the last day of the period. If the last day of the period falls on a Saturday, Sunday, or a legal holiday, that day shall be omitted and the period shall end on the next day which is not a Saturday, Sunday, or legal holiday.

1.2.2 The time for completion of the Project indicated on the electronic **Bid Form** is the time for Substantial Completion of all Work applicable to the Bidder.

1.2.3 The State may assign all or any portion of its interest in a Contract with one or more of the successful Bidders to another successful Bidder as an agreed condition for an award of the Contract for the respective Bid. The assignment may include, without limitation, the duty to schedule, coordinate, and administer the Contract.

1.2.4 The Contractor is responsible for scheduling the Project, coordinating the Subcontractors, and providing other services identified in the Contract Documents.

1.2.5 By submitting its Bid, the Bidder indicates its understanding that the Contract Sum, based on its Bid and as amended by Change Orders, includes all costs that the Contracting Authority owes the Bidder.

1.3 Written Notice

1.3.1 Notice under the Contract Documents shall be validly given if:

1.3.1.1 delivered personally to a member of the organization for whom the notice is intended;

1.3.1.2 delivered, or sent by registered or certified mail, to the last known business address of the organization; or

1.3.1.3 sent by facsimile, email, or web-based project management software, provided the original signed document is delivered within 3 business days after the date of the electronic transmission.

1.3.2 Notices provided to one Project Participant from another shall be simultaneously copied to the prospective Bidders, the Owner, the Contracting Authority, and the A/E.

1.4 Use of the State's Electronic Bidding Software

1.4.1 The Bidder shall use the State's Electronic Bidding Software to submit its Bid for this Project. Paper Bids will not be accepted.

1.4.2 Bidders, Subcontractors, and Material Suppliers may download the Contract Documents as PDF files from the State's Electronic Bidding Software at no charge by registering and associating with a company at https://bidexpress.com.

1.4.3 Bidders are encouraged to create and obtain approval of their Digital ID well in advance of the bid deadline. Approval may take up to seven business days.

1.4.4 Bidders are also encouraged to click the "Select for Bidding" link on the electronic **Bid Form** to be listed on the electronic Plan Holder's list and submit payment to receive notifications regarding Addenda and other announcements.

1.4.5 Subcontractors and Material Suppliers may view the electronic Plan Holder's list to determine potential Bidders.

1.4.6 Bidders, Subcontractors, and Material Suppliers are encouraged to attend a contractor webinar or contact the vendor's help desk through the means identified at https://bidexpress.com to increase their knowledge of using the State's Electronic Bidding Software.

ARTICLE 2 - BIDDING PROCEDURES

2.1 Examination of Contract Documents and the Site

2.1.1 Before submitting a Bid, the Bidder shall examine all Contract Documents, including, but not limited to, the Drawings, Specifications, and Addenda for all divisions of Work for the Project, noting in particular all requirements that may affect its Work in any way.

2.1.2 The Bidder's failure to become acquainted with the extent and nature of Work required to complete any portion of the Work in conformity with the requirements of the Contract Documents, shall not be a basis for additional compensation.

2.1.3 Before submitting a Bid, the Bidder should not only examine and evaluate the Site and related Project conditions where the Work will be performed, but shall also consider when the Work will be performed including, but not limited to, the following:

2.1.3.1 the condition, layout, and nature of the Site and surrounding area;

2.1.3.2 the availability and cost of labor;

2.1.3.3 the availability and cost of materials, supplies, and equipment;

2.1.3.4 the cost of temporary utilities required in the Bid;

2.1.3.5 the cost of any permit or license required by a local or regional authority having jurisdiction over the Project;

2.1.3.6 the usual weather conditions of the Project location;

2.1.3.7 conditions bearing upon transportation, disposal, handling, and storage of equipment, materials, and waste; and

2.1.3.8 subsurface and concealed physical conditions and related information provided in the Contract Documents.

2.2 Pre-Bid Meeting

2.2.1 The Bidder is encouraged to attend the pre-bid meeting, where the A/E, the Contracting Authority, and the Owner will receive questions regarding the Contract Documents. If not given in **Document 00 10 00** - **Solicitation**, the A/E shall issue notice of the time and place of any pre-bid meeting to each registered Plan Holder.

2.2.2 The A/E shall prepare minutes of the pre-bid meeting for the Project record. If questions raised by the prospective Bidders require changes to, or clarifications of, the Contract Documents, the A/E shall issue the changes by written Addendum, along with a list of pre-bid meeting attendees.

2.2.3 Additional compensation shall not be based upon the Bidder's failure to attend the pre-bid meeting, which results in the Bidder's incomplete knowledge and familiarity of the Project requirements.

2.3 Request for Interpretation

2.3.1 If the Bidder finds any perceived ambiguity, conflict, error, omission, or discrepancy within the Contract Documents, including the Drawings, Specifications, and Addenda, or between any of the Contract Documents and Applicable Law, the Bidder shall submit a written Request for Interpretation ("RFI") to the A/E for an interpretation or clarification.

2.3.1.1 The Bidder is responsible for prompt delivery of the RFI.

2.3.1.2 The A/E shall respond to RFIs received more than 7 days before the bid opening.

2.3.2 The A/E shall issue Addenda in response to RFIs that modify or clarify the Contract Documents. Any Addenda issued within 72 hours before any bid opening (excluding Saturdays, Sundays, and legal holidays) shall extend the bid opening date by 7 days pursuant to **Section 3.3.1**.

2.3.2.1 The Addenda may be delivered via the State's State's Electronic Bidding Software, facsimile or e-mail, posted to a web or FTP site, or otherwise furnished to each registered Plan Holder.

2.3.3 Any interpretation or clarification of the Contract Documents made by any Person other than the A/E, in any manner other than a written Addendum, shall not be binding, and the Bidder shall not rely upon the interpretation or clarification.

2.3.4 The successful Bidder shall not be compensated for a claim alleging insufficient data, incomplete, ambiguous, conflicting, or erroneous Contract Documents or proposed Contract Documents, or assumed conditions regarding the nature, extent, or character of the Work, if the Bidder did not submit a related RFI prior to the bid opening.

2.4 Basis of Design and Acceptable Components

2.4.1 The Contract Documents may list components produced by specific manufacturers to denote kind, quality, or performance requirements.

2.4.2 The component listed first is the Basis of Design Component.

2.4.3 Other listed components are Acceptable Components.

2.4.3.1 If the Bidder includes an Acceptable Component in its Bid, the Bidder is responsible for the costs of coordination and modification required.

2.5 Substitutions Prior to Bid Opening

2.5.1 If the Bidder proposes to use an article, device, material, equipment, form of construction, fixture, or item other than the Basis of Design or Acceptable Components named in the Specifications, the Bidder shall certify that the proposed item is equal in quality and all aspects of performance and appearance, to the item specified.

2.5.1.1 If approval of a Substitution requires changes to the Contract Documents or affects the work of other trades, the Bidder is responsible for the additional costs, including, but not limited to, changes to the design by the A/E.

2.5.2 The Bidder shall submit its request for Substitution to the A/E no later than 10 days prior to the bid opening, which must include:

2.5.2.1 the name and complete description of the proposed Substitution, including Drawings, performance and test data, and other information necessary for a complete evaluation; and

2.5.2.2 a statement setting forth any changes that the Proposed Substitution will require in the Contract Documents or the Project.

2.5.3 If the A/E approves the Proposed Substitution, the A/E shall issue an Addendum.

2.5.4 If the A/E does not approve the Proposed Substitution, the A/E shall inform the Bidder of its decision, which is final. The A/E may reject a proposed Substitution because the Bidder failed to provide sufficient information to enable the A/E to completely evaluate the Proposed Substitution without causing a delay in the bid deadline.

2.5.5 Proposed Substitutions received by the A/E less than 10 days prior to the bid deadline shall not be considered.

2.6 Electronic Bid Form

2.6.1 Each Bid shall be submitted on the electronic **Bid Form** through the State's Electronic Bidding Software.

2.6.1.1 All sections of the electronic **Bid Form**, including a completed "Bidder Affirmation and Disclosure" section acknowledging that the Bidder affirms, understands, and will abide by the requirements of Executive Order 2019-12D related to providing services only within the United States and Executive Order 2022-02D prohibiting purchases from or investment in any Russian institution or company, and a completed "Commitment to Participate in the EDGE Business Assistance Program" page, shall be submitted with the Bid. Failure to do so may cause the Bid to be rejected as non-responsive.

.1 If the names, locations, and service locations of Subcontractors are not known at the time of the Bid deadline, the Bidder must provide the information requested with its **Subcontractor and Material Supplier Declaration**.

2.6.1.2 Unless the Bidder withdraws the Bid as provided in **Article 4**, the Bidder is required to comply with all requirements of the Contract Documents, regardless of whether the Bidder had actual knowledge of the requirements and regardless of any statement or omission made by the Bidder that might indicate a contrary intention.

2.6.2 The Bidder shall fill in all relevant spaces on the electronic **Bid Form**. The State's Electronic Bidding Software will identify any incomplete required fields.

2.6.3 If the Bidder is a corporation, partnership, or sole proprietorship, an officer, partner or principal of the Bidder shall enter the legal name of the Bidder in the space provided on the electronic **Bid Form**. If the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall enter the legal name of the applicable member in the space provided.

2.7 Allowances

2.7.1 If Allowances are provided on the electronic **Bid Form**, the amount of each Allowance shall be included in the Base Bid amount. Allowances shall be used solely for the purpose of determining the adjustment to the Contract Sum for the difference between the amount of the Allowance and the actual cost of the related Work provided. Allowances shall not include the Contractor's Fee.

2.8 Unit Prices

2.8.1 If Unit Prices are requested on the electronic **Bid Form**, the amount of the scheduled quantities shall be included in the Base Bid amount. Unit prices shall be used solely for the purpose of determining the adjustment to the Contract Sum for the difference between the estimated quantities on the electronic **Bid Form** and the actual quantities provided.

2.8.2 Unit Prices shall include all materials, equipment, labor, delivery, installation, and any other cost or expense, in connection with, or incidental to, the performance of that portion of the Work. Unit Prices shall not include the Contractor's Fee on account of the associated Unit Price Work. The Bidder shall submit Unit Prices for all items listed.

2.9 Alternates

2.9.1 If an Alternate is listed on the electronic **Bid Form**, the Bidder shall fill in the applicable space with a positive or negative bid amount as applicable. The Contracting Authority reserves the right to accept or reject any or all bid amounts for Alternates, in whole or in part, and in any order.

2.9.1.1 If no change in the bid amount is required, indicate "$0."

2.9.1.2 Failure to make an entry on any Alternate shall cause the Bid to be rejected as non-responsive if that Alternate is selected.

2.9.1.3 Failure to indicate a negative number will indicate the Bidder's intent to increase the Base Bid by the amount entered in the applicable space.

2.9.1.4 If an Alternate is not selected, an entry as listed in **Section 2.9.1.2** on that Alternate shall not, by itself, render a Bid non-responsive.

2.10 Submittals with Electronic Bid Form

2.10.1 The Contracting Authority shall reject a Bid as non-responsive if the Bidder fails to submit the following with the Bid:

2.10.1.1 An electronic facsimile of the Bid Guaranty as provided in **Article 5**, meeting the requirements of Ohio Revised Code ("ORC") Sections 153.54 and 153.571.

2.10.1.2 The original unaltered Bid Guaranty shall be delivered to the Contracting Authority within 3 business days after the public bid opening as provided in Ohio Administrative Code ("OAC") Section 153:1-8-01(H).

2.10.2 If the apparent low Bidder does not submit a valid Power of Attorney of the agent signing for the Surety with its Bid, the Contracting Authority shall direct the apparent low Bidder to deliver a valid and appropriate Power of Attorney to the Contracting Authority within a period determined by the Contracting Authority. The Contracting Authority shall not enter into a Contract without a valid Power of Attorney.

2.10.3 The Bidder is encouraged to submit background information with its Bid using the **Bidder's Qualifications** form and including, but not limited to, the information listed in this **Section 2.10**. If the apparent low Bidder does not submit the **Bidder's Qualifications** form and related information attached to the electronic **Bid Form**, the Bidder shall provide it upon request in accordance with **Section 3.5.4**, including, but not limited to:

2.10.3.1 the overall experience of the Bidder, including number of years in business under present and former business names;

2.10.3.2 a complete listing of all the Bidder's ongoing construction projects and a listing of construction projects which are similar in cost and type to the Project completed by the Bidder in the last 5 years. Include information of

the scope of work and value of each contract, a description of Encouraging Diversity Growth and Equity ("EDGE") participation and performance, and a project name/contact Person/address/phone number for the owner and the architect or engineer for each project;

2.10.3.3 a Certificate of Compliance with Affirmative Action Programs, issued pursuant to ORC Section 9.47, by the Equal Opportunity Coordinator of the Department of Administrative Services;

2.10.3.4 a complete listing of Affirmative Action and EDGE program violations in the last 5 years;

2.10.3.5 a complete listing of Prevailing Wage, EPA, OSHA, or other regulatory entity issues or violations in the last 5 years;

2.10.3.6 a complete listing of judgments, claims, arbitration proceedings or suits pending or outstanding in the last 5 years;

2.10.3.7 a complete listing of Drug-Free Workplace Program and Drug-Free Safety Program ("DFSP") violations in the last 5 years;

2.10.3.8 upon request of the Contracting Authority, the apparent low Bidder shall submit the following information, which is not a public record under ORC Section 149.43; and shall remain confidential, except under proper order of a court:

- **.1** an annual financial statement prepared within the 12 months prior to the bid opening by an independent licensed accounting firm; and the name, address, contact Person, and phone number of the bank normally used by the Bidder for its primary banking**;** or
- **.2** a financial report generated within 30 days prior to the bid opening from Standard and Poor, Dun and Bradstreet or a similar company acceptable to the Contracting Authority documenting the financial condition of the Bidder; and the name, address, contact Person, and phone number of the bank normally used by the Bidder for its primary banking.

2.10.3.9 a description of the Bidder's relevant facilities and major equipment, whether leased or owned;

2.10.3.10 a description of the management experience of the Bidder's project manager(s) and superintendent(s) and a comprehensive resume for each;

2.10.3.11 a description of the EDGE-certified Business Enterprises the Bidder proposes as Subcontractors for this Project by attaching a fully completed **EDGE Affidavit** form for each EDGE-certified Business Enterprise;

2.10.3.12 to support a Bond, a current and signed Certificate of Compliance issued by the Ohio Department of Insurance, showing the Surety is licensed to do business as a surety in Ohio;

2.10.3.13 a current Ohio Workers' Compensation Certificate;

2.10.3.14 if the Bidder is a foreign corporation not incorporated under the laws of Ohio, a Certificate of Good Standing from the Ohio Secretary of State; or, if the Bidder is a foreign person or partnership, evidence that the Bidder filed, with the Ohio Secretary of State, a Power of Attorney designating the Ohio Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under ORC Section 153.05 or under ORC Sections 4123.01 to 4123.94, inclusive;

2.10.3.15 evidence that the Bidder is enrolled in, and in good standing in, a DFSP approved by the Ohio Bureau of Workers' Compensation ("OBWC"); and

2.10.3.16 any other data or information which the A/E may request concerning the responsibility of the Bidder, including a complete list of major Subcontractors with an estimated contract value of $200,000 or more, which the Bidder proposes to employ on the Project.

2.11 Changes in the Bid Amount

2.11.1 Any change to a previously submitted Bid shall be resubmitted through the State's Electronic Bidding Software prior to the deadline for submission of Bids.

ARTICLE 3 - BID OPENING AND EVALUATION

3.1 Delivery of Bid

3.1.1 The Bidder shall submit its Bid to the Contracting Authority prior to the time of the bid deadline.

3.1.2 Bids that are submitted after the time of the bid deadline shall not be considered.

3.2 Bid Opening

3.2.1 Electronic Bids shall be received until the time stated when all Bids shall be electronically opened and the Bid tabulation made public by posting on the State's Electronic Bidding Software.

3.2.2 The posting of Bid tabulations is for informational purposes only and is not to be construed as an acceptance or rejection of any Bid submitted.

3.2.3 The contents of the electronic **Bid Form** and its attachments are public records and shall be available for inspection, upon request, at any time after the bid deadline, except for any information that is not defined as a public record under Ohio law.

3.3 Bid Deadline Extension

3.3.1 If an Addendum is issued within 72 hours prior to the published time for the bid deadline, excluding Saturdays, Sundays and legal holidays, the bid deadline shall be extended 7 days. If the Contracting Authority approves, the bid deadline may be extended for more than 7 days, and consideration for additional advertising may be recommended.

3.3.2 As part of issuing any Addendum earlier than 72 hours prior to the published time for the bid deadline, excluding Saturdays, Sundays and legal holidays, only the Contracting Authority may approve a revised bid deadline or additional advertising.

3.4 Bid Evaluation Criteria

3.4.1 The Contracting Authority reserves the right to accept or reject any or all Bids, in whole or in part, and reserves the right to award the Contract to any remaining Bidder the Contracting Authority determines, in its sole discretion, to have submitted the lowest responsive and responsible Bid.

3.4.2 The Contracting Authority reserves the right to accept or reject any or all Alternates. Alternates may be accepted or rejected in any order.

3.4.3 If any Bidder has engaged in collusive bidding, the Contracting Authority shall reject that Bidder's Bid as non-responsible for the Contract. A collusive bidder may also be debarred from future State Contracts.

3.4.4 The Contracting Authority reserves the right to waive, or to allow any Bidder a reasonable opportunity to cure a minor irregularity or technical deficiency in a Bid, provided the irregularity or deficiency does not affect the bid amount, or otherwise give the Bidder a competitive advantage. Noncompliance with any material requirements of the Contract Documents shall cause a Bid to be rejected as non-responsive.

3.4.5 If, in the opinion of the Owner, the award of the Contract to the lowest Bidder is not in the best interest of the State, with the written consent of the Contracting Authority, the Owner may accept, in its discretion, another Bid so opened, or the Contracting Authority may reject all Bids and advertise for other Bids. The advertisement shall be for the period, in the form, and in the publications directed by the Contracting Authority.

3.5 Bid Evaluation Procedure

3.5.1 The Contract shall be awarded to the lowest responsive and responsible Bidder as determined in the discretion of the Contracting Authority, or all Bids may be rejected in accordance with Applicable Law.

3.5.1.1 In determining which Bid is the lowest, the Contracting Authority shall consider the Base Bid and the bid amounts for any Alternate, or Alternates, which the Owner decides, in its sole discretion, to accept.

3.5.1.2 The total of the bid amounts for the accepted Alternate(s) shall be added to, or deducted from, the Base Bid, as applicable, for determining the lowest Bidder.

3.5.1.3 If two Bidders submit the same bid amount and both are determined to be responsive and responsible, the Contracting Authority may select one Bidder by the flip of a coin, which shall be conducted in the presence of both Bidders and shall be final.

.1 If one of the Bidders refuses to participate in, or fails to be present at, the flip of a coin, the remaining Bidder shall be selected.

3.5.2 A Bidder for a Contract shall be considered responsive if the Bidder's Bid responds to the Contract Documents in all material respects and contains no irregularities or deviations from the Contract Documents that would affect the amount of the Bid or otherwise give the Bidder a competitive advantage.

3.5.2.1 A Bid shall be rejected as non-responsive if the Bid contains a Bid Guaranty executed by a Surety not licensed in Ohio or a Bid Guaranty that is otherwise determined to be insufficient by the Contracting Authority.

3.5.2.2 The Bidder may be subject to a Pre-Award Affirmative Action Compliance Review pursuant to OAC Section 123:2-5-01 including a review of the Bidder's employment records and an on-site review.

.1 The Bidder must submit the information requested no later than 10 days after receipt of the request. Failure to timely respond to this request for records may result in the Bidder being found non-responsive.

3.5.2.3 If the lowest Bidder is non-responsive, the Bidder shall be notified according to **Section 3.6**.

3.5.3 In determining whether a Bidder is responsible, factors to be considered include, without limitation:

3.5.3.1 preferences required by law, where applicable;

3.5.3.2 the experience of the Bidder;

3.5.3.3 the financial condition of the Bidder;

3.5.3.4 the conduct and performance of the Bidder on previous Contracts, including compliance with Equal Employment Opportunity in the Construction Industry Administrative Rules, OSHA and Prevailing Wage laws, and demonstration of good faith effort to participate in the EDGE Business Development program, or actual participation in the EDGE Business Development program, or both, as indicated in the ORC and the Ohio Administrative Code;

3.5.3.5 the facilities of the Bidder;

3.5.3.6 the management skills of the Bidder, including the capability of the Bidder to construct and manage the entire Project, including but not limited to the plumbing, fire protection, heating, ventilating and air conditioning, and electrical branches or classes of the Work; and

3.5.3.7 the Bidder's ability to execute the Contract properly, including past performance of the Bidder and the Subcontractors that the Bidder proposes to use on the Project.

3.5.4 The A/E shall obtain from the lowest responsive Bidder any information the Contracting Authority determines appropriate to consideration of factors showing responsibility. If the lowest responsive Bidder is responsible, the Contract shall be awarded to that Bidder, unless all Bids are rejected. The Bidder shall provide all requested information within 3 days of a request from the A/E**,** or a longer period, if the Contracting Authority consents in writing.

3.5.5 If the lowest responsive Bidder is not responsible, the Contracting Authority shall evaluate the next lowest Bidder according to the procedures set forth in this **Section 3.5** until the Contract is awarded, all Bids are rejected, or all responsive Bidders are determined to be not responsible.

3.6 Rejection of Bid

3.6.1 If the lowest Bidder is not responsive or responsible, the Contracting Authority shall reject the Bid and notify the Bidder in writing by Certified Mail of the finding and the reasons for the finding.

3.6.2 Ten Percent Rule.

3.6.2.1 If the lowest responsive and responsible Bid for the Contract, including the Base Bid and accepted Alternates if any, exceeds an amount 10 percent greater than the published Estimated Construction Cost for the Contract, the Contracting Authority shall reject all Bids.

3.6.3 A Bidder notified in accordance with **Section 3.6.1** may object to its rejection by filing a written protest, which must be received by the Contracting Authority within 5 days of the notification provided pursuant to **Section 3.6.1**.

3.6.4 Upon receipt of a timely protest, the Contracting Authority shall meet with the protesting Bidder to hear its objections. ORC Chapter 119 administrative hearing requirements are not applicable to the bid protest meeting**.**

3.6.4.1 No Contract award shall become final until after the Contracting Authority has met with all Bidders who have timely filed protests and the award of the Contract is affirmed by the Contracting Authority.

3.6.4.2 If all protests are rejected, the Contract shall be awarded to the lowest responsive and responsible Bidder, or all Bids shall be rejected.

3.7 Notice of Intent to Award

3.7.1 The Contracting Authority shall notify the apparent successful Bidder that upon satisfactory compliance with all conditions precedent for execution of the Contract, within the time specified, the Bidder shall be awarded the Contract.

3.7.2 The Contracting Authority reserves the right to rescind any Notice of Intent to Award if the Contracting Authority determines it issued the Notice of Intent to Award in error, or if the conditions precedent for execution of Contract set forth in **Article 6** are not met.

ARTICLE 4 - WITHDRAWAL OF BID

4.1 Withdrawal prior to Bid Opening

4.1.1 A Bidder may withdraw a Bid after submitting the Bid through the State's Electronic Bidding Software, provided the Bidder submits its request through the State's Electronic Bidding Software prior to the bid deadline.

4.2 Withdrawal after Bid Opening

4.2.1 The Bid shall remain valid and open for acceptance for a period of 60 days after the bid opening; provided, however, a Bidder may withdraw a Bid from consideration after the bid opening if the bid amount was substantially lower than the amounts of other Bids, providing the Bid was submitted in good faith, and the reason for the bid amount being substantially lower was a clerical mistake, as opposed to a judgment mistake, and was actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of Work, labor, or material made directly in the compilation of the bid amount.

4.2.1.1 Notice of a request to withdraw a Bid shall be made in writing filed with the Contracting Authority within 2 business days after the bid opening. The Contracting Authority reserves the right to request the Bidder to submit evidence substantiating the Bidder's request to withdraw the Bid.

4.2.1.2 No Bid may be withdrawn under **Section 4.2.1** which would result in awarding a Contract involving the same item on another Bid to the same Bidder.

4.2.2 If a Bidder withdraws its Bid under **Section 4.2.1**, the Contracting Authority may award the Contract to the next lowest responsive and responsible Bidder, or reject all Bids and advertise for other Bids. In the event the Contracting Authority advertises for other Bids, the withdrawing Bidder shall pay the costs, in connection with the re-bidding, of printing new Contract Documents, required advertising, and printing and mailing of notices to prospective Bidders, if the Contracting Authority finds that these costs would not have been incurred but for the withdrawal.

4.2.3 A Bidder may withdraw the Bidder's Bid at any time after the 60-day period described in **Section 4.2.1** by giving written notice to the Contracting Authority.

4.3 Refusal to Accept Withdrawal

4.3.1 If the Contracting Authority contests the right of a Bidder to withdraw a Bid pursuant to **Section 4.2.1**, a hearing shall be held within 10 days after the bid opening and the Contracting Authority shall issue an order allowing or denying the claim of this right within 5 days after the hearing is concluded. The Contracting Authority shall give the withdrawing Bidder timely notice of the time and place of the hearing.

4.3.1.1 The Contracting Authority shall make a stenographic record of all testimony, other evidence, and rulings on the admissibility of evidence presented at the hearing. The Bidder shall pay the costs of the hearing.

4.3.1.2 Pursuant to ORC Section 119.12, the Bidder may appeal the order of the Contracting Authority required by **Section 4.3.1**.

4.4 Refusal to Perform

4.4.1 In the event the Contracting Authority denies the request for withdrawal and the Bidder refuses to perform the Contract, the Contracting Authority may reject all Bids or award the Contract to the next lowest responsive and responsible Bidder.

4.5 Effect of Withdrawal

4.5.1 A Bidder, who is permitted to withdraw a Bid under **Section 4.2.1**, shall not supply material or labor to, or perform a subcontract or other work for, the Person to whom the Contract is awarded; or otherwise benefit, directly or indirectly, from the performance of the Project for which the withdrawn Bid was submitted; without the Contracting Authority's prior written consent.

ARTICLE 5 - BID GUARANTY AND BOND

5.1 Bid Guaranty

5.1.1 The Bidder shall submit a Bid Guaranty with the Bidder's Bid, payable to the Contracting Authority, in the form of either:

5.1.1.1 the signed **Document 00 43 13** - **Bid Security Form** contained in the Contract Documents for the amount of the Base Bid plus all additive Alternates; or

5.1.1.2 a certified check, cashier's check, or letter of credit, for 10 percent of the Base Bid, plus all additive Alternates – a letter of credit shall expressly provide that it is revocable only by the Contracting Authority.

5.1.2 The Bid Guaranty shall be in form and substance satisfactory to the Contracting Authority and shall serve as an assurance that upon acceptance of the Bid, the Bidder shall comply with all conditions precedent for Contract execution, within the time specified by the Contracting Authority.

5.1.3 If the blank line on the **Bid Security Form** is not filled in, the penal sum shall be the full amount of the Base Bid plus all additive Alternates. If the blank line is filled in, the amount shall not be less than the full amount of the Base Bid plus all additive Alternates, stated in dollars and cents. A percentage is not acceptable. In the event the blank line is filled in for an amount less than the full amount of the Base Bid plus all additive alternates, the Bid shall be rejected as non-responsive.

5.1.4 An authorized agent must sign the **Bid Security Form**, and the Bidder shall provide a Power of Attorney from the Surety. A Surety authorized by the Ohio Department of Insurance to transact business in Ohio must issue the **Bid Security Form**.

5.1.5 The requirements of ORC Section 3901.86 may be applicable requiring an Ohio resident agent countersign the **Bid Security Form**. The Bidder shall determine the applicability of this provision.

5.1.6 Bid Guaranties in the form of a certified check, cashier's check, or letter of credit shall be returned to unsuccessful Bidders 60 days after the bid opening. Bid Guaranties in the form of a certified check, cashier's check, or letter of credit shall be returned to the successful Bidder upon providing **Document 00 61 13** - **Performance and Payment Bond Form** from a Surety satisfactory to the Contracting Authority.

5.2 Forfeiture of Bid Guaranty

5.2.1 If for any reason, other than as authorized by **Section 4.2.1** or **Section 5.3**, the Bidder fails to execute the Agreement, and the Contracting Authority awards the Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder:

5.2.1.1 The Bidder who failed to execute the Agreement is liable to the State for the difference between its Bid and the Bid of the next lowest responsive and responsible Bidder, or for a penal sum not to exceed ten percent of the bid amount, whichever is less.

5.2.2 If the Contracting Authority then awards a Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder and that Bidder fails or refuses to execute the Agreement:

5.2.2.1 The liability of the lowest responsive and responsible Bidder shall be the difference between the bid amount of the lowest responsive and responsible Bidder and another Bidder which the Contracting Authority determines is the lowest responsive and responsible Bidder, except as provided in **Section 5.3**, but not in excess of the liability specified in **Section 4.2.2**.

5.2.2.2 The liability on account of an award to the lowest responsive and responsible Bidder beyond the third lowest responsive and responsible Bidder shall be determined in like manner**.**

5.2.3 If the Contracting Authority does not award the Contract to another Bidder under **Section 5.2.2**, but submits the Project for re-bidding:

5.2.3.1 The Bidder failing or refusing to execute the Agreement is liable to the State for a penal sum not to exceed 10 percent of the Bidder's bid amount or the costs in connection with the resubmission of printing new Contract Documents, required advertising, and printing and mailing notices to prospective Bidders, whichever is less, except as provided in **Section 5.3**.

5.3 Exception to Forfeiture

5.3.1 A Bidder for a Contract with the State costing less than $500,000 may withdraw its Bid from consideration if its Bid for another Contract with the State for less than $500,000 has already been accepted if:

5.3.1.1 the Bidder certifies in good faith that the total amount of its current contracts is less than $500,000; and

5.3.1.2 the Bidder's Surety certifies in good faith that the Bidder is unable to perform the subsequent Contract because such performance would exceed the Bidder's bonding capacity.

5.3.2 If a Bid is withdrawn pursuant to **Section 5.3.1**:

5.3.2.1 the Contracting Authority may award the Contract to another Bidder which the Contracting Authority determines is the lowest responsive and responsible Bidder or reject all Bids and submit the Project for re-bidding; and

5.3.2.2 neither the withdrawing Bidder nor the Bidder's Surety shall be liable for the difference between the Bidder's Bid and that of the next lowest responsive and responsible Bidder for a penal sum, or for the costs of printing new Contract Documents, required advertising, and printing and mailing notices to prospective Bidders.

5.4 Bond

5.4.1 Prior to signing the Agreement, the Bidder shall provide the Bond required by law in form and substance satisfactory to the Contracting Authority, and from a Surety licensed to do business in the state of Ohio and satisfactory to the Contracting Authority.

5.4.1.1 If the Bidder provided **Document 00 43 13** - **Bid Security Form**, described in **Section 5.1.1.1**, as its Bid Guaranty then that form shall be the Bond.

5.4.1.2 If the Bidder provided another form of Bid Guaranty, described in **Section 5.1.1.2**, then **Document 00 61 13** - **Performance and Payment Bond Form**, described in **Section 5.1.6**, shall be the Bond.

5.4.1.3 The Bidder shall not be required to provide both forms described above.

5.4.2 The Bond must be in the full amount of the Contract to indemnify the State against all direct and consequential damages suffered by failure of the Contractor to perform according to the provisions of the Contract and in accordance with the Plans, Specifications, details, and bills of material therefore and pay all lawful claims of Subcontractors, Material Suppliers, and laborers for labor performed or materials furnished in performing and completing the Contract.

ARTICLE 6 - CONTRACT AWARD AND EXECUTION

6.1 Conditions Precedent for Execution of Contract

6.1.1 The successful Bidder must submit the items in this **Section 6.1** to the Contracting Authority before executing the Agreement.

6.1.2 Bond, and to support the Bond, a Certificate of Compliance issued by the Ohio Department of Insurance, showing the Surety is licensed to do business in the state of Ohio.

6.1.3 Ohio Workers' Compensation Certificate

6.1.4 Certificate of Compliance with Affirmative Action Programs, issued by the Equal Opportunity Coordinator. The form must be submitted through the Ohio Business Gateway: http://business.ohio.gov/efiling/.

6.1.5 Certificate of Insurance (ACORD form is acceptable) and copy of additional insured or loss payee endorsement. The Contracting Authority reserves the right to request and receive a certified copy of the Contractor's insurance policies.

6.1.6 If a Bidder is a foreign corporation (e.g., not incorporated under the laws of Ohio) it must submit a Certificate of Good Standing from the Ohio Secretary of State showing the right of the Bidder to do business in the state of Ohio.

6.1.7 If a Bidder is an individual or partnership, nonresident of the State, it must submit a Power of Attorney designating the Ohio Secretary of State as the Bidder's agent for accepting service of summons in any action brought under ORC Section 153.05 or under ORC Sections 4123.01 to 4123.94, inclusive.

6.1.8 Evidence that the Bidder is enrolled in, and in good standing in, a DFSP approved by the OBWC.

6.1.9 Required Notice of Unresolved Findings for Recovery.

6.1.9.1 By submitting its Bid, the Bidder warrants that it is not subject to an unresolved findings for recovery under ORC Section 9.24. ORC Section 9.24 prohibits the State from awarding a Contract to any Bidder against whom the Auditor of State has issued a finding for recovery if the finding for recovery is unresolved at the time of award. If the Contract is awarded to a Bidder subject to an unresolved finding for recovery under ORC Section 9.24, the Contract is void on its face and the Contractor shall immediately repay to the Owner any funds paid under the Contract.

6.1.10 EDGE Program – Supporting Documentation Required.

6.1.10.1 The Bidder shall provide evidence acceptable to the Contracting Authority of the Bidder's participation in the EDGE Program by contracting with EDGE-certified Business Enterprise(s) for the Project by submitting a fully completed EDGE Affidavit for each EDGE-certified Business Enterprise, by requesting a waiver or partial waiver of the advertised EDGE Program participation goal for the Project on the Bidder's company letterhead including full documentation of the Bidder's good faith effort to contract with EDGE-certified Business Enterprise(s) for this Project, or both.

6.1.11 If the Bidder is a joint venture, it must submit the executed agreement between the joint venturers describing the division of services/work and percentage of contract for each company, and a Power of Attorney which authorizes one or more individuals to bind the joint venture and each individual joint venturer to Contract Modifications.

6.2 Non-compliance with Conditions Precedent

6.2.1 The award of the Contract and execution of the Agreement require the Contractor to comply with:

6.2.1.1 all conditions precedent for execution of the Contract within 10 days of the date of the Notice of Intent to Award; and

6.2.1.2 the **Bidder's Qualifications** form, including a fully completed **EDGE Affidavit** for each EDGE-certified Business Enterprise, not previously provided within 3 business days of receiving the Contracting Authority's request.

6.2.2 Non-compliance with the conditions precedent for execution of the Contract as stated in **Section 6.1** within the timelines stated in **Section 6.2.1** following the date of the Notice of Intent to Award shall be sufficient cause to permit the Contracting Authority to cancel the Notice of Intent to Award, for the Bidder's lack of responsibility and award the Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder; or the Contracting Authority may re-bid the Work at its sole discretion.

6.2.3 The Contracting Authority may extend the time for complying with the conditions precedent for execution of the Contract for good cause. The extension is not a waiver of the conditions precedent for execution of the Contract.

6.3 Time Limits

6.3.1 The Contracting Authority's failure to award the Contract and execute the Agreement-within 60 days of the bid opening invalidates the entire bid process and all Bids submitted, unless the time is extended by written consent of the apparent lowest responsive and responsible Bidder and the Contracting Authority.

6.3.1.1 If the Contracting Authority awards the Contract within 60 days of the bid opening, increases in material, labor, and subcontract costs shall be borne by the Bidder.

6.3.1.2 If failure to execute the Contract within 60 days of the bid opening is due to matters for which the State is solely responsible, the Contractor is entitled to a Change Order authorizing payment of verifiable increased costs in materials, labor, or subcontracts. This increase shall not exceed the difference in price between the successful Bidder and the price of the next lowest responsive and responsible Bidder.

6.3.1.3 If failure to execute the Contract within 60 days of the bid opening is due to matters for which the Contractor is responsible, the Contracting Authority shall not grant a request for increased costs.

6.4 Notice to Proceed

6.4.1 The Contracting Authority shall issue a Notice to Proceed to the Contractor, which establishes the date for commencement and the calendar days allocated for Substantial Completion of all Work. Within 10 days of the date of the Notice to Proceed, or other period as mutually agreed by the Contractor and the Contracting Authority, the Contractor shall furnish the following submittals to the A/E:

6.4.1.1 Schedule of Values;

6.4.1.2 preliminary schedule of Shop Drawings and other Submittals;

6.4.1.3 Subcontractor and Material Supplier Declaration form, with completed "Bidder Affirmation and Disclosure" forms acknowledging that the Contractor affirms, understands, and will abide by the requirements of Executive Order 2019-12D and Executive Order 2022-02D for Subcontractors that were not identified in the electronic **Bid Form**;

6.4.1.4 qualifications of proposed project manager(s) and superintendent(s) and a comprehensive resume of each; and

6.4.1.5 evidence that an authorization agreement for automatic deposit of state warrants has been submitted to Ohio Shared Services using the electronic funds transfer form provided on the Internet at http://supplier.ohio.gov.

6.5 Prevailing Wage Rates

6.5.1 The Bidder shall base its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.14. Refer to **Document 00 73 43 - Wage Rate Requirements** for related information and the Project's prevailing rates of wages with an appropriate ratio of registered apprentices.

6.5.2 The Bidder shall not be entitled to an increase in the Contract Sum on account of an increase in prevailing wage rates, except as otherwise provided by Applicable Law. The Bidder is responsible for compliance of its Subcontractors with prevailing wage requirements.

6.5.3 Within 10 days of the date of the Notice to Proceed, the Contractor shall provide the Contracting Authority's Prevailing Wage Coordinator with a schedule of dates during the term of the Contract when the Contractor shall pay wages to its employees for the Project.

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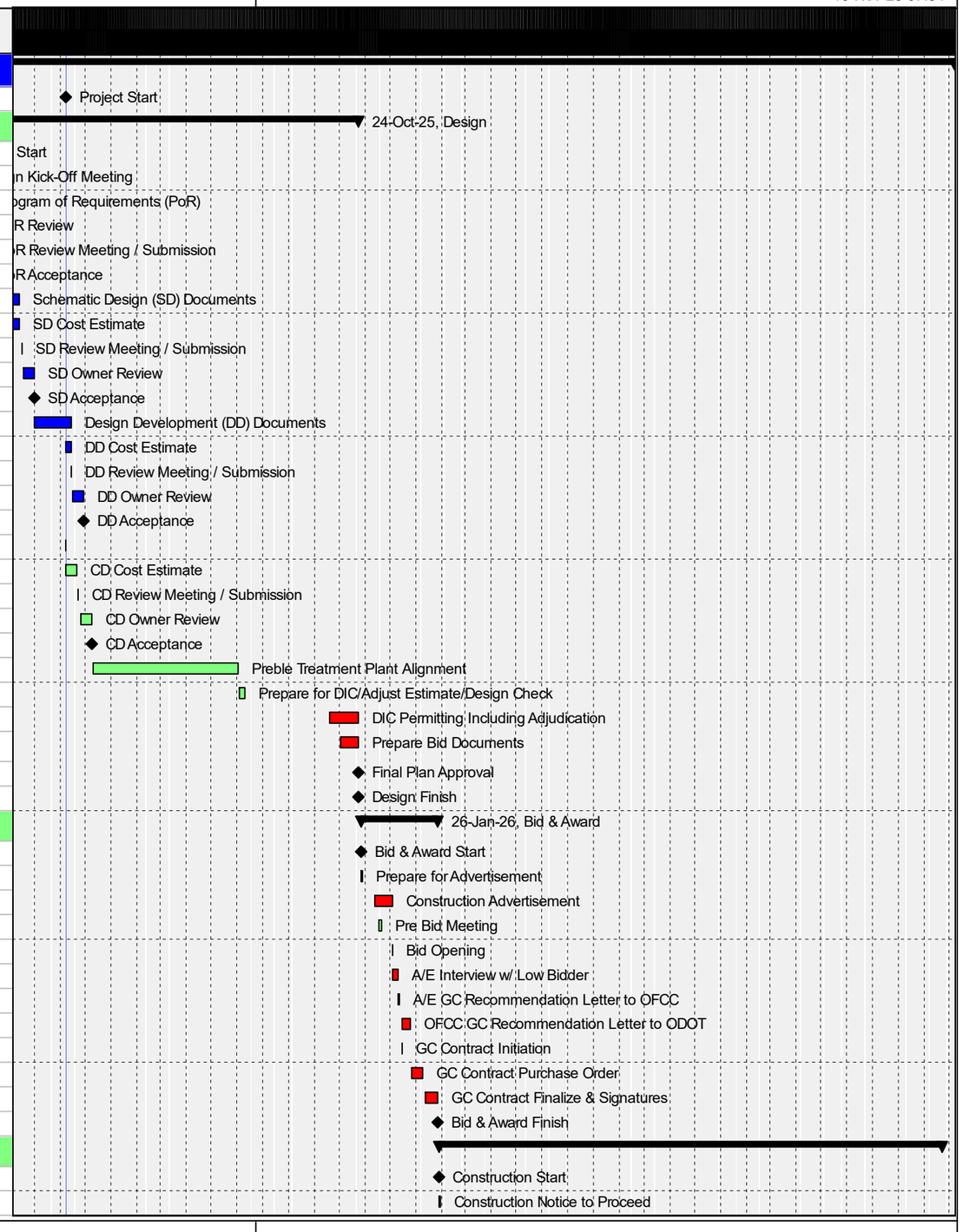
SECTION 00 31 13 PRELIMINARY SCHEDULES

Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish
Preble FSMF Delivery Schedule		820	729	0%	28-Jun-24 A	07-Oct-27
Start	Project Start	0	0	0%	07-Nov-24	
Design		332	241	0%	28-Jun-24 A	24-Oct-25
D0000	Design Start	0	0	100%	28-Jun-24 A	
D1000	Design Kick-Off Meeting	1	0	100%	10-Jul-24 A	10-Jul-24 A
D1010	Program of Requirements (PoR)	15	0	100%	11-Jul-24 A	31-Jul-24 A
D1015	PoR Review	5	0	100%	25-Jul-24 A	31-Jul-24 A
D1020	PoR Review Meeting / Submission	1	0	100%	01-Aug-24 A	01-Aug-24 A
D1030	PoR Acceptance	0	0	100%		01-Aug-24 A
D1040	Schematic Design (SD) Documents	30	0	100%	02-Aug-24 A	13-Sep-24 A
D1050	SD Cost Estimate	10	0	100%	30-Aug-24 A	13-Sep-24 A
D1060	SD Review Meeting / Submission	1	0	100%	16-Sep-24 A	16-Sep-24 A
D1070	SD Owner Review	10	0	100%	17-Sep-24 A	30-Sep-24 A
D1080	SD Acceptance	0	0	100%		30-Sep-24 A
D1090	Design Development (DD) Documents	30	0	86.67%	01-Oct-24 A	13-Nov-24 A
D1100	DD Cost Estimate	4	0	0%	07-Nov-24 A	13-Nov-24 A
D1110	DD Review Meeting / Submission	1	0	0%	14-Nov-24 A	14-Nov-24 A
D1120	DD Owner Review	10	0	0%	15-Nov-24 A	29-Nov-24 A
D1130	DD Acceptance	0	0	0%		29-Nov-24 A
D1140	Construction Documents (CD) Documents	65	0	0%	02-Dec-24 A	07-Nov-24
D1150	CD Cost Estimate	10	10	0%	07-Nov-24	21-Nov-24
D1160	CD Review Meeting / Submission	1	1	0%	22-Nov-24	22-Nov-24
D1170	CD Owner Review	10	10	0%	25-Nov-24	09-Dec-24
D1180	CD Acceptance	0	0	0%		09-Dec-24
D1185	Preble Treatment Plant Alignment	120	120	0%	10-Dec-24	02-Jun-25
D1186	Prepare for DIC/Adjust Estimate/Design Check	5	5	0%	03-Jun-25	09-Jun-25
D1190	DIC Permitting Including Adjudication	25	25	0%	19-Sep-25*	24-Oct-25
D1195	Prepare Bid Documents	15	15	0%	03-Oct-25	24-Oct-25
D1200	Final Plan Approval	0	0	0%		24-Oct-25
D9999	Design Finish	0	0	0%		24-Oct-25
Bid & Award		61	61	0%	27-Oct-25	26-Jan-26
B0000	Bid & Award Start	0	0	0%	27-Oct-25	
B1040	Prepare for Advertisement	3	3	0%	27-Oct-25	29-Oct-25
B1050	Construction Advertisement	15	15	0%	12-Nov-25	03-Dec-25
B1055	Pre Bid Meeting	3	3	0%	18-Nov-25	20-Nov-25
B1060	Bid Opening	1	1	0%	04-Dec-25	04-Dec-25
B1070	A/E Interview w/ Low Bidder	5	5	0%	04-Dec-25	10-Dec-25
B1080	A/E GC Recommendation Letter to OFCC	2	2	0%	11-Dec-25	12-Dec-25
B1090	OFCC GC Recommendation Letter to ODOT	8	8	0%	15-Dec-25	24-Dec-25
B1100	GC Contract Initiation	1	1	0%	15-Dec-25	15-Dec-25
B1110	GC Contract Purchase Order	10	10	0%	26-Dec-25	09-Jan-26
B1120	GC Contract Finalize & Signatures	10	10	0%	12-Jan-26	26-Jan-26
B9999	Bid & Award Finish	0	0	0%		26-Jan-26
Construction		415	415	0%	29-Jan-26	23-Sep-27
C0000	Construction Start	0	0	0%	29-Jan-26	
C0100	Construction Notice to Proceed	1	1	0%	29-Jan-26	29-Jan-26



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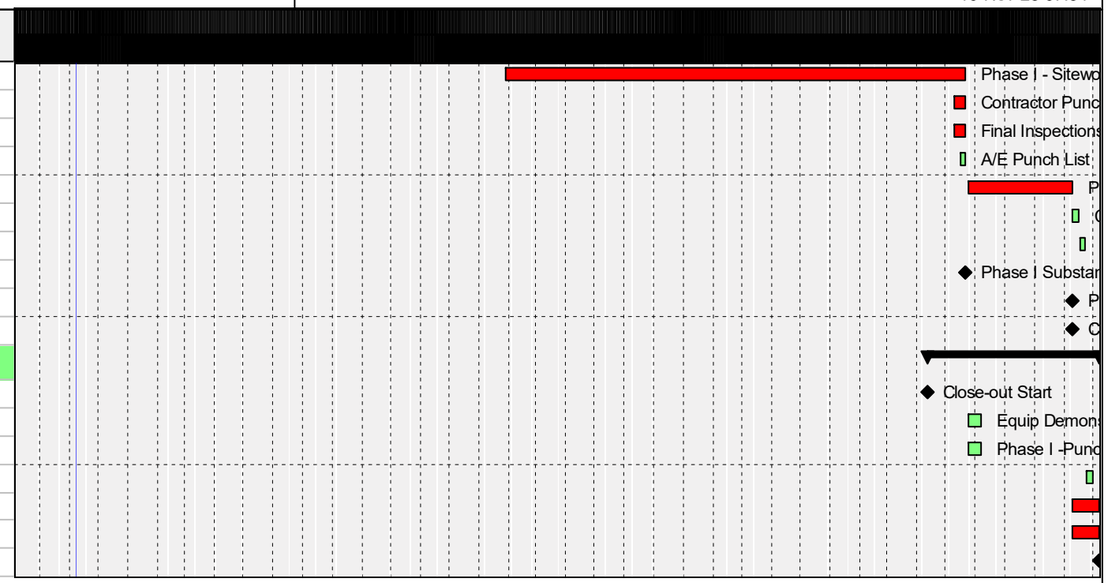
Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish
C1010	Phase I - Sitework & Building Construction	330	330	0%	29-Jan-26	21-May-27
C1020	Contractor Punch List	10	10	0%	10-May-27	21-May-27
C1021	Final Inspections	10	10	0%	10-May-27	21-May-27
C1025	A/E Punch List	5	5	0%	17-May-27	21-May-27
C1030	Phase II - Site Work/Building Demo/New Parking Lot	75	75	0%	24-May-27	09-Sep-27
C1031	Contractor Punch List	5	5	0%	10-Sep-27	16-Sep-27
C1032	A/E Punch List	5	5	0%	17-Sep-27	23-Sep-27
C9000	Phase I Substantial Completion	0	0	0%		21-May-27
C9010	Phase II & III Substantial Completion	0	0	0%		09-Sep-27
C9999	Construction End	0	0	0%		09-Sep-27
Close-out		125	125	0%	12-Apr-27	07-Oct-27
CL0000	Close-out Start	0	0	0%	12-Apr-27	
CL1005	Equip Demonstration & Training	10	10	0%	24-May-27	07-Jun-27
CL1010	Phase I -Punchlist Repairs	10	10	0%	24-May-27	07-Jun-27
CL1011	Phase II & III - Punchlist Repairs	5	5	0%	24-Sep-27	30-Sep-27
CL1020	As-Builts	20	20	0%	10-Sep-27	07-Oct-27
CL1030	O&M / Warranty Documents	20	20	0%	10-Sep-27	07-Oct-27
CL9999	Contract Completion	0	0	0%		07-Oct-27



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SECTION 00 31 19 EXISTING CONDITION INFORMATION

Sanitary Plot Plan attached for reference. More information available upon request.

SANITATION PLOT PLAN
FOR

Ohio Department of Transportation
234 Quaker Trace Road

Parcel H25530510000017000
Lanier Township
Preble County, Ohio
January 20, 2021

ORIGINAL SEAL RED

Ryan D. Hillard PE. No. 73285

Hillard Engineering and Surveying, LLC.
3701 Johnson Road
Springfield, Ohio 45502
(937) 244-8835

DWG. BY: *RDH*

ACAD FILE: *201208-Perkins Carmack-SPP* FB/PG: *X/X*

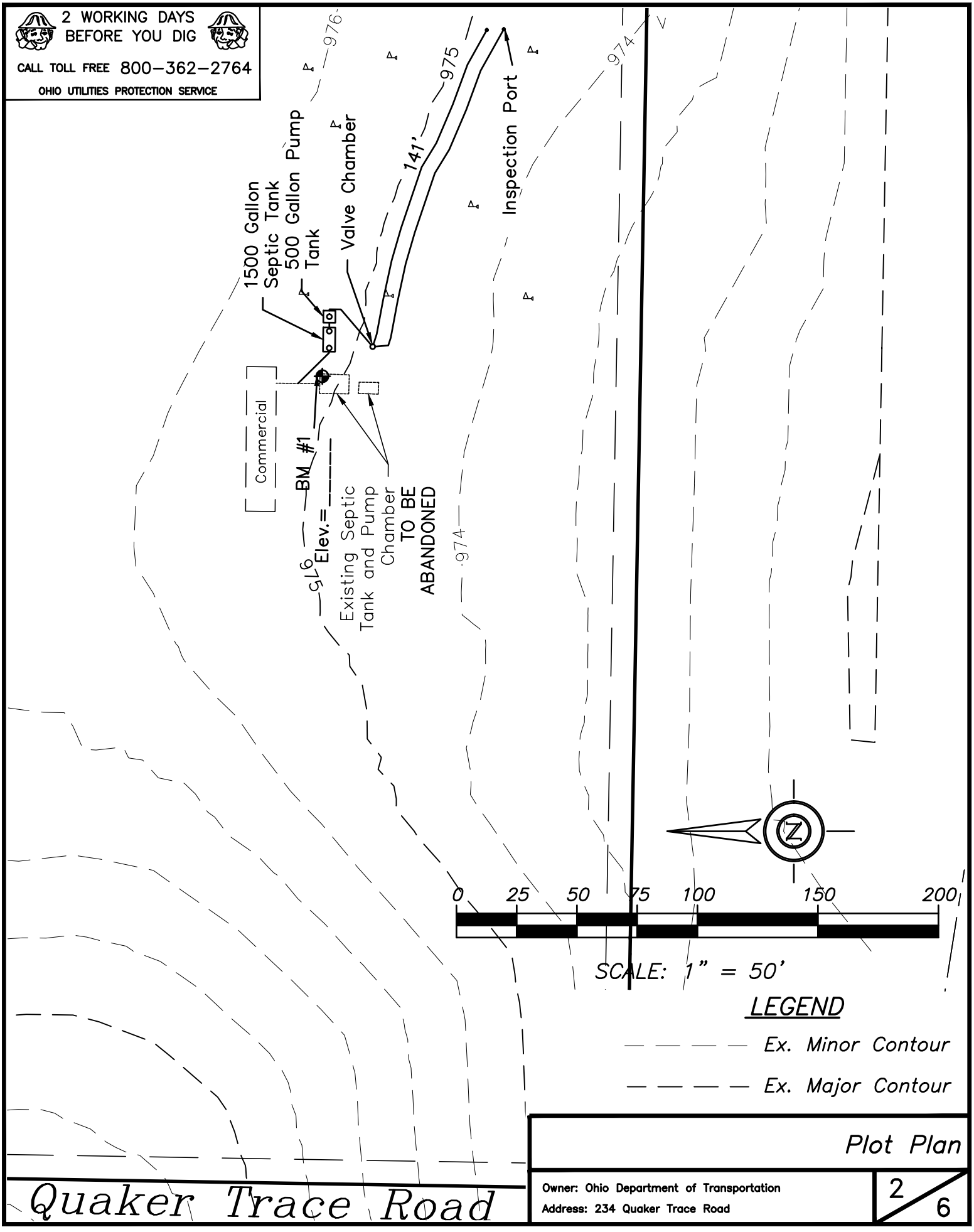
PLOT FILE: *HES* PROJECT: *201208*

2 WORKING DAYS BEFORE YOU DIG

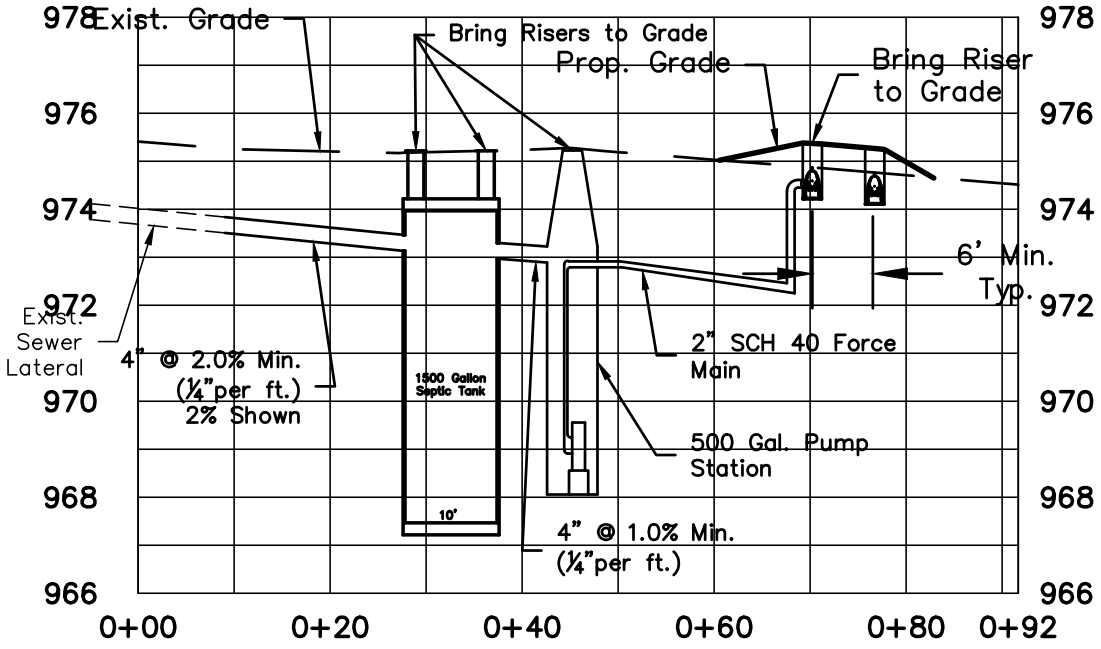
CALL TOLL FREE 800-362-2764

OHIO UTILITIES PROTECTION SERVICE

Owner: Ohio Department of Transportation
Address: 234 Quaker Trace Road


2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE 800-362-2764
OHIO UTILITIES PROTECTION SERVICE
976
975
974
141'
Inspection Port
Valve Chamber
1500 Gallon
Septic Tank
500 Gallon Pump
Tank
Commercial
BM #1
Elev.=
975
Existing Septic
Tank and Pump
Chamber
TO BE
ABANDONED
974
N
0
25
50
75
100
150
200
SCALE: 1" = 50'
LEGEND
Ex. Minor Contour
Ex. Major Contour
Quaker Trace Road
Plot Plan
Owner: Ohio Department of Transportation
Address: 234 Quaker Trace Road
2
6

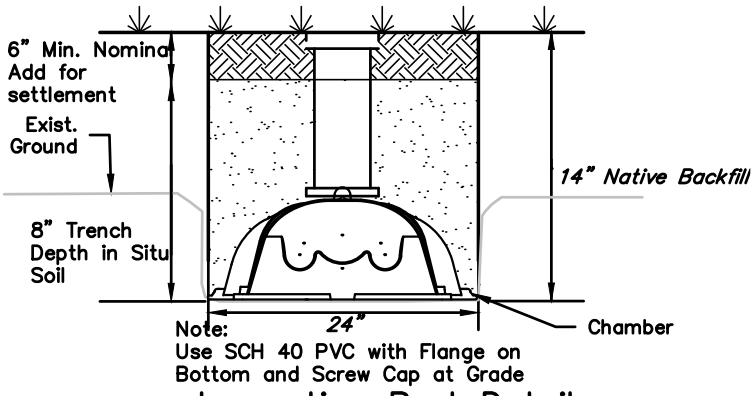
Septic System Profile



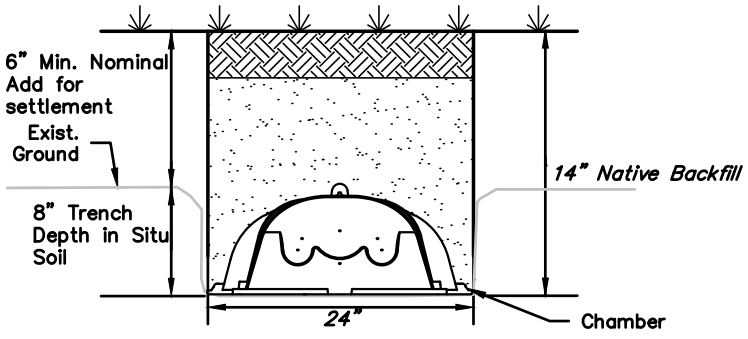
Scales:
Horiz. 1"=20'
Vert. 1"=4'

Profile

Owner: Ohio Department of Transportation
Address: 234 Quaker Trace Road



Inspection Port Detail



Trench Detail
Site Specific

Inspection Port Detail
N.T.S

Leaching Trench Detail
N.T.S

Design Notes:

The new system will connect to the line coming out of the existing building. The lateral will be extended at 2% grade to the new 1500 gallon septic tank set a minimum 10' from the building. A 500 gallon pump station will be installed behind the septic tank. The pump with control panel with event counter, and alarm will supply 39.3 GPM at 13.5 ft. of head, will pump the effluent through an 2" SCH40 PVC pipe, to 2 separate laterals with gate valves on each lateral in a chamber. The pump must be provided with quick disconnect to allow for ease of service. All 2 trenches with individual laterals with gate valves, 2" SCH40 PVC 141' long with 1/8" holes every 3', starting at 1.5' from the end. The 1−1/2" lines will be hung inside Infiltrator low profile chambers with the holes at 12 o'clock the last hole will be at 6 o'clock to allow for draining of the lateral. Place a 2'x3'x1" gravel pad under the last hole. At the end of the line there will be a 2" sweep 90 with a threaded cap and plug for flushing and distal pressure testing. The distal pressure should be 5 ft.

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE 800−362−2764
OHIO UTILITIES PROTECTION SERVICE

1. BENCHMARK:
   #1 Existing Concrete Lid = _____

2. Topograpic information information is based on a combination of field data collected January, 2021 and aerial photogrammetry. Contour Interval = 1.0'

3. ALL CONSTRUCTION INSPECTIONS BY PREBLE COUNTY HEALTH DISTRICT.

4. NO WATER SOFTENER DISCHARGE, DOWNSPOUT DRAINS, FOUNDATION DRAINS, OR OTHER CLEAN WATER CONNECTIONS ARE TO BE MADE TO THE SEPTIC SYSTEM. DIVERT DOWNSPOUTS AWAY FROM SOIL ABSORBTION AREA.

5. MAINTAIN A MINIMUM OF 8" CLEARANCE FROM THE TOP OF FOUNDATION TO THE FINISHED GRADE ADJACENT TO ALL BUILDINGS.

6. SLOPE THE FINISHED GRADE AWAY FROM ALL BUILDINGS FOR A MINIMUM OF 6" IN 10 FEET.

7. NO WELL IS TO BE LOCATED WITHIN 50' OF LEACH FIELD OR SEPTIC TANK.

8. UNDERGROUND UTILITIES LOCATIONS ARE BASED ON AVAILABLE RECORDS AND AS SUCH SHOULD BE REGARDED AS APPROXIMATE. ACTUAL LOCATION SHALL BE VERIFIED IN THE FIELD PRIOR TO THE START OF ANY CONSTRUCTION.

OHIO UTILITIES PROTECTION SERVICE	800–362–2764
AT&T	800–362–2764
OHIO EDISON COMPANY	937–322–4911
COLUMBIA GAS OF OHIO	937–328–3130
TIME WARNER CABLE	937–294–6400

9. PIPE FROM HOUSE TO TANK IS 4" SCHEDULE 40 PVC ASTM 1785 UNLESS OTHERWISE NOTED. CORRUGATED PIPE IN THE LEACH FIELD IS ASTM F405. ALL SEPTIC PIPE WITHIN 10' OF THE HOUSE FOUNDATION MUST BE WATERTIGHT.

10. PUMP SEPTIC TANK EVERY 5 YEARS IN CONFORMANCE WITH OHIO DEPARTMENT OF HEALTH AND MIAMI COUNTY HEALTH DISTRICT REQUIREMENTS.

11. PROTECT THE AREA OF THE PRIMARY AND REPLACMENT AREA FROM ANY UNNECESSARY TRAFFIC AS DELINEATED ON THE PLAN. DO NOT COMPACT SOIL.

12. INSTALLER SHALL COORDINATE ANY CHANGES WITH DESIGNER AND PREBLE COUNTY HEALTH DISTRICT.

13. MAINTAIN MINIMUM 6' BETWEEN LATERALS.

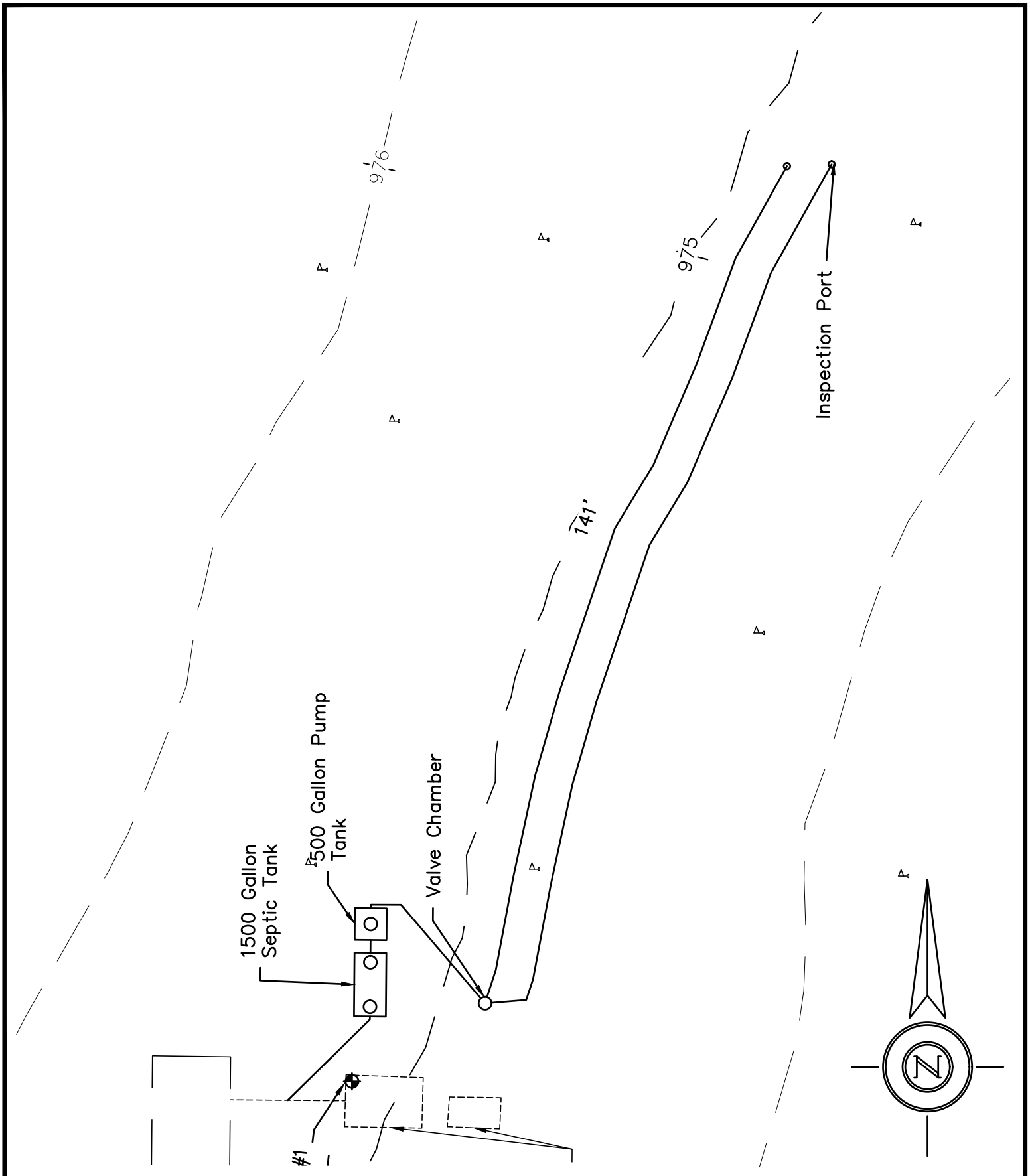
14. ALL UNNECESARY TRAFFIC SHALL BE AVOIDED OVER THE SOIL ABSORBTION SYSTEM.

15. THIS SYSTEM IS APPROVED FOR A 1500 GALLON SEPTIC TANK, 500 GALLON PUMP STATION TO 2–141' CHAMBER LEACH TRENCHES WITH LOW PRESSURE DISTRIBUTION.

2 WORKING DAYS
BEFORE YOU DIG
CALL TOLL FREE 800–362–2764
OHIO UTILITIES PROTECTION SERVICE

Notes

Owner: Ohio Department of Transportation
Address: 234 Quaker Trace Road



20 Scale Plot Plan

Owner: Ohio Department of Transportation

Address: 234 Quaker Trace Road

6/6

Calculation of the Trench Bottom Area and Trench Length Required for an Alternative Leaching Trenches

Date: 12/31/2020 Job#: 201208
Rev.
Location: 234 Quaker Trace Road, West Alexandria

Design Parameters:

Flow	15	Employees @ 20gpd/employee
Soil Type:		Silty Clay Loam
Slope:	1.0%	
Infiltration Distance:		2"-distance from trench bottom to soil limitation or restrictive layer (ID)
Limiting Layer:		10"-Seasonal High Water
Max. Trench Depth:	4	inches
Design Trench Depth:	8	inches Low Pressure Distribution

Step 1:	Calculate the Daily Design Flow (DDF) (120gpd/bedroom)		300	gpd	(DF)
Step 2:	Determine Infiltration (Soil) Loading Rate from Tyler Table (ILR)	From Table:	0.4	GPD/FT^2	Silt Loam
Step 3:	Calculate the Trench Bottom Area (TBA)		750	FT^2	(DDF/ILR)
	25% Reduction for Chambers	Use	563		
Step 4:	Determine the Hydraulic Linear Loading Rate (HLLR)	From Table:	2.4	GAL/D/FT	Clay
Step 5:	Calculate the Min. Req. Length of the Trenches Along the Contour (TL)		125	FT	(DDF/HLLR)
		Use	141		
Step 6:	Calculate the Resting Leaching Trench Bottom Area (RTBA)		0	FT^2	(TBA*0.25)
Step 7:	Calculate the Total Leach Trench Bottom Area (TLTBA)		563	FT^2	(TBA+RTBA)
Step 8:	Calculate the Component Width (CW)		4	FT wide	(TLTBA/TL)
Step 9:	Calculate the number of trenches	24" Wide	2	Trenches	(CW/2')

Terry Perkins

From: Matt Deaton <matt@deatonsoils.com>
Sent: Saturday, March 23, 2019 9:37 AM
To: Terry Perkins
Subject: Engineer

Terry,

I forgot to add a name of an engineer I have worked with for drawing the plans.

Ryan Hillard of Hillard Engineering and Surveying – 937-244-8835
Email – ryan@hillardengineeringandsurveying.com

Thanks,
Matt

Matthew Deaton
Deaton Soil Services
(937)-533-9991
matt@deatonsoils.com
www.facebook/DeatonSoilServices

----------PLEASE NOTE UPDATED EMAIL----------
For scheduling new appointments, please email sales@deatonsoils.com

For general questions, please email matt@deatonsoils.com or shauna@deatonsoils.com

Deaton Soil Services, LLC
1427 Concord Fairhaven Rd.
Eaton, OH 45320
Cell: (937) 533-9991
Home: (937) 456-9559

Friday, March 15, 2019

State of Ohio
Department of Transportation
Attn : Terry Perkins
234 Quaker Trace Rd
West Alexandria, Ohio 45381

Dear Mr. Perkins,

Enclosed you will find the requested soil evaluation for the site at 234 Quaker Trace Road in Preble County Ohio. The soil evaluation was the result from the need for a new sewage treatment system for the existing buildings.

Two detailed soil descriptions along with a series of approximately 30 soil borings were conducted at the proposed location. The sample locations have each been marked with pink glow metal flags and were labeled accordingly to their soil site numbers. The boundary of the proposed location has been marked using pink glow metal flags.

In the packet you will find 2 technical soil descriptions, a site map marking the locations of the sample sites, and an abbreviations sheet. Copies of this letter, soil descriptions, and site map should be submitted to the Ohio EPA. The EPA will make the determination as to whether the soil and site area is suitable for onsite sewage treatment.

The soils described in the proposed treatment area represented by site 1 contains dense glacial till that ranges from 20 to 34 inches from the surface with a representative depth of 26 inches. As a result of the dense glacial till, the soils of this area contain a perched seasonal high water table at a depth that ranges from 8 to 12 inches from the surface with a representative depth of 10 inches to the 5 percent 2 chroma iron depletions.

The soils described in the proposed treatment area represented by site 2 contains dense glacial till that ranges from 14 to 24 inches from the surface with a representative depth of 18 inches. As a result of the dense glacial till, the soils of this area contain a perched seasonal high water table at a depth that ranges from 5 to 10 inches from the surface with a representative depth of 6 inches to the 5 percent 2 chroma iron depletions.

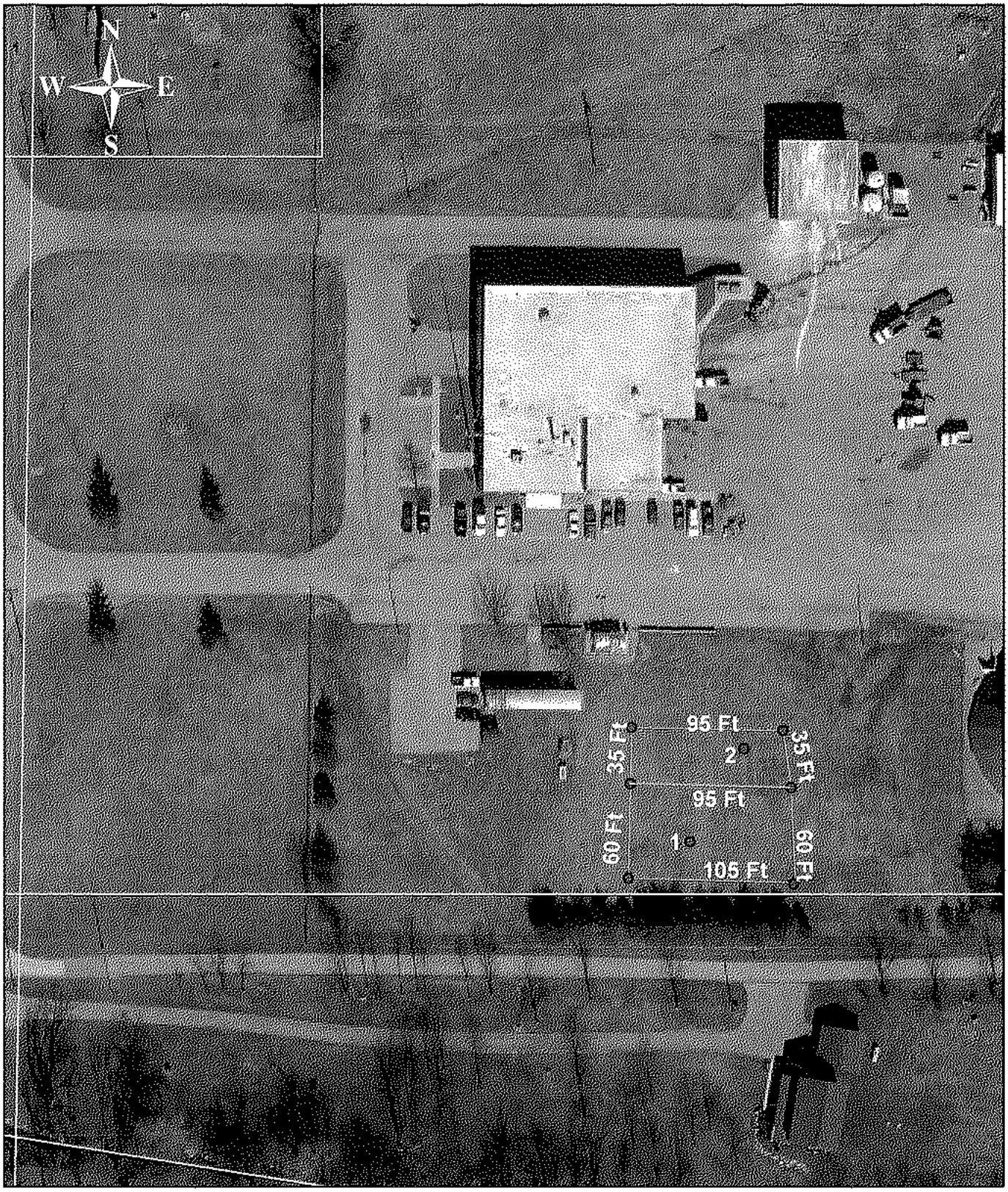
Please protect the proposed location from any disturbances by clearly marking the area. Disturbances to the area could result in compaction of the soils and subsequent failure to the sewage treatment system.

If you have any questions, concerns, or need clarification, please feel free to contact me.

Sincerely,

Matthew H. Deaton - Certified Professional Soil Scientist

ODOT - Terry Perkins - Soil Evaluation
234 Quaker Trace Rd. West Alexandria, Ohio 45381



Pedon Descriptions

Property Boundary - From GIS

Potential treatment area

0 15 30 60 Feet

Prepared by:
Matthew Deaton 3/20/19

DEATON SOIL SERVICES

State of Ohio Environmental Protection Agency
Division of Surface Water
Division of Environmental & Financial Assistance

Supplement to Form A – B13

Onsite Sewage Treatment Systems

Soil Evaluation

FOR AGENCY USE ONLY

Date Received: / /

I. Owner Information:

Owner:	State of Ohio - ODOT				
Mailing Address:	234 Quaker Trace Rd.				
City:	West Alexandria	State: Ohio		Zip: 45381	
Phone:	(937) 839-4494 Fax:	-	E-mail :	terryperkins@perkinscarmack.com	

II. General Site Information:

Property Address:	234 Quaker Trace Rd.		
County:	Preble	Township/City:	/West Alexandria
Latitude:	39° 44' 24.22"	Longitude:	84° 34' 28.11"
Lot Number:		Method:	☐ Pit ☐ Auger ☒ Probe
Soil Site Number:	1		
Date of Evaluation:	March, 9 2019		OFF 65

III. Site Specific Information:

Outside of EATON

Soil Series Identified:	Crosby
Land Use:	Grass
Landform:	Till Plain
Position on Landform:	Backslope
Percent of Slope:	0 to 2
Shape of Slope:	Linear Linear

IV. Soil Evaluation Analysis:

Vertical		Estimating Soil Saturation: Color			Estimating Soil Permeability: Criteria for Determining Loading Rates							
			Redoximorphic Features		Texture			Structure				
Horizon	Depth Inches	Matrix Color	Conc. (high chroma)	Depletion (low chroma)	Class	Approx % Clay	% Rock Frag.	Grade	Size	Type shape	Consistency	Other Soil Features
Ap	0-9	10YR 4/3	NA	NA	Silt Loam	20	2	1	M	GR	FR	
Bt1	9-14	10YR 4/6	15% 10YR 5/6 mad	15% 10YR 5/2 mac	Clay Loam	35	2	2	M	SBK	FI	
Bt2	14-20	10YR 4/6	15% 10YR 5/6 mad	15% 10YR 5/2 mac	Clay	42	2	2	M	SBK	FI	
BC	20-25	10YR 4/4	20% 10YR 5/6 mad	20% 10YR 5/2 mac	Clay Loam	30	5	1	M	SBK	FI	
Cd	25-48	10YR 4/4	10% 10YR 5/6 rpo	10% 10YR 5/2 rpo	Loam	24	5	0	NA	MA	VFI	

Condition	Depth to (in)	Type of Material or Bedrock	Remarks:		
Perched Seasonal Water Table	9				
Apparent Water Table					
Sand/Gravel Lense		Extremely Gravelly Sand			
Bedrock					
Restrictive Layer	25	☒ Dense glacial till	☐ Fill	☐ Fragipan	Compacted lacustrine sediments
		☐ > 45 % clay (Obsolete)	☐ Compacted material	☐ Bedrock	
Estimated Linear Loading Rate	2.7	gpd/ft (system installed 12" above limitation)			

V. Signature of Soils Evaluator:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and that all the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are substantial penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Typed name: Matthew Deaton Certification #: **CPSS 330813**

Signature: Date: 3/15/19

State of Ohio Environmental Protection Agency
Division of Surface Water
Division of Environmental & Financial Assistance

Supplement to Form A – B13

Onsite Sewage Treatment Systems

Soil Evaluation

FOR AGENCY USE ONLY

Date Received: / /

I. Owner Information:

Owner:	State of Ohio - ODOT		
Mailing Address:	234 Quaker Trace Rd.		
City: West Alexandria		State: Ohio	Zip: 45381
Phone: (937) 839-4494	Fax: -	E-mail :	terryperkins@perkinscarmack.com

II. General Site Information:

Property Address:	234 Quaker Trace Rd.		
County:	Preble	Township/City:	/West Alexandria
Latitude:	39° 44' 24.79"	Longitude:	84° 34' 27.69"
Lot Number:		Method:	☐ Pit ☐ Auger ☒ Probe
Soil Site Number:	2		
Date of Evaluation:	March, 9 2019		

III. Site Specific Information:

Soil Series Identified:	Crosby
Land Use:	Grass
Landform:	Till Plain
Position on Landform:	Backslope
Percent of Slope:	0 to 2
Shape of Slope:	Linear Linear

IV. Soil Evaluation Analysis:

		Estimating Soil Saturation			Estimating Soil Permeability							
Vertical		Color			Criteria for Determining Loading Rates							
Horizon	Depth Inches	Matrix Color	Redoximorphic Features		Texture			Structure				Other Soil Features
			Conc. (high chroma)	Depletion (low chroma)	Class	Approx % Clay	% Rock Frag.	Grade	Size	Type shape	Consistency	
Ap	0-6	10YR 4/3	NA	NA	Silt Loam	18	2	1	M	SBK	FR	
Bt	6-15	10YR 4/6	20% 10YR 5/6 mad	20% 10YR 5/2 mac	Clay Loam	38	5	2	M	SBK	FI	
BC	15-18	10YR 4/4	20% 10YR 5/6 mad	20% 10YR 5/2 mac	Gravelly Clay Loam	30	20	1	M	SBK	FI	
Cd	18-36	10YR 4/4	15% 10YR 5/6 rpo	15% 10YR 5/2 rpo	Gravelly Loam	20	30	0	NA	MA	VFI	

Condition	Depth to (in)	Type of Material or Bedrock	Remarks:		
Perched Seasonal Water Table	6				
Apparent Water Table					
Sand/Gravel Lense		Extremely Gravelly Sand			
Bedrock					
Restrictive Layer	18	☒ Dense glacial till	☐ Fill	☐ Fragipan	Compacted lacustrine sediments
		☐ > 45 % clay (Obsolete)	☐ Compacted material	☐ Bedrock	
Estimated Linear Loading Rate	2.0	gpd/ft (system installed 12" above limitation)			

V. Signature of Soils Evaluator:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and that all the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are substantial penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Typed name: Matthew Deaton Certification #: **CPSS 330813**

Signature: Date: 3/15/19

Zoeller Company

System Head Curve and Pump Selection Tool

Static Head Information	
Static Head - elevation difference from low water to outfall	5.0 feet
System high point above outfall?	No

Friction Head Information		
Pipe		
How many different pipes in the system (not counting laterals)?	1	
Pipe 1 Length	30 feet	
Pipe 1 Size	2 inches	
Pipe 1 Class	SCH 40	
Pipe 2 Length		
Pipe 2 Size		
Pipe 2 Class		
Pipe 3 Length		
Pipe 3 Size		
Pipe 3 Class		
Pressurized Laterals?	Yes	Flow Deviation Along Lateral 4.0% ✓
How many are dosed at once?	2	
Length of one lateral	141 feet	
Size of lateral	2 inches	
Class of lateral	SCH 40	

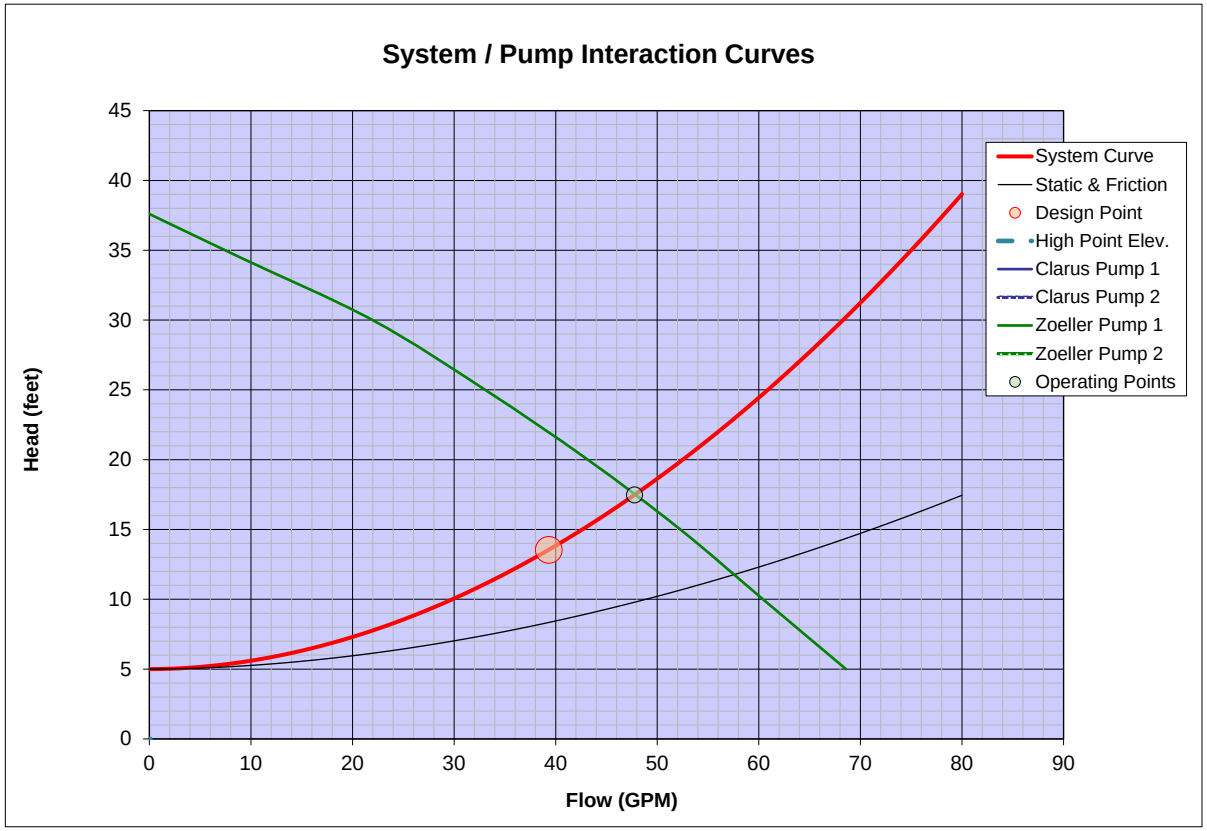
Fittings & Discharge Assemblies

Type	Size	Quantity	Flow
90 Elbow	2 inches	4	100 %
Tee (branch flow)	2 inches	2	100 %
Gate Valve (full open)	2 inches	2	100 %

Special Friction Considerations		
Weep Hole	Yes	1/8 "
Add-In Friction	15 % of Pipe Loss	
Automatic Multizone Valve?	No	
Pressure Filter?	No	

Operating Head Information	
System Type	Low Pressure Pipe
Required Pressure	5. feet
Number of Orifices	92
Size of Orifices	1/8 "
Spider Valve Orifice Sizes (Data originates from Spider Valve Sizing Tab)	

Factors and Coefficients	
Hazen-Williams C Factor	130
Discharge Coefficient (Cd)	0.61
Lateral Design Mode	On



NOTE: THE DISPLAYED PUMP CURVES HAVE BEEN ADJUSTED TO ACCOUNT FOR THE EFFECT OF THE WEEP HOLE

Pump Selection	60 Hz	Frequency	
Clarus Environmental Pumps			**Operating Points**
Clarus Pump 1			
Flow Control Orifice?			
Clarus Pump 2			
Flow Control Orifice?			
Zoeller Pump Company Pumps			
Zoeller Pump 1	152, 0.4hp, 60Hz		47.8 GPM @ 17.5'
Zoeller Pump 2			

Design Point
39.3 GPM
@ 13.5 ' TDH

Curve Zoom Range	80 GPM

Project Data		Notes:
Project Name:	ODOT Garage	
Project Address	234 Quaker Tract Road West Alexandria, OH	
Contact Info:	Ryan Hillard, PE, PS ryan@hillardengineeringandsurveying.co 937-244-8835	

Version 4.50

SECTION 00 31 21 SURVEY INFORMATION

More information available upon request.

SECTION 00 31 24 ENVIRONMENTAL ASSESSMENT INFORMATION

ODOT PREBLE FULL-SERVICE MAINTENANCE FACILITY
234 QUAKER-TRACE ROAD
WEST ALEXANDRIA, OHIO

Phase I Environmental Site Assessment

Prepared For:
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202

Prepared By:
Resource International, Inc.
6350 Presidential Gateway
Columbus, Ohio 43231

Rii Project #B-24-018

September 2024

RESOURCE INTERNATIONAL, INC.
6350 Presidential Gateway
Columbus, Ohio 43231
Ph: 614.823.4949

September 11, 2024

Chad R. Kohler, AIA, NCARB
Architectural Practice Lead
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202

Re: Phase I Environmental Site Assessment (ESA)
ODOT Preble Full-Service Maintenance Facility
234 Quaker-Trace Road
West Alexandria, Ohio
Rii Project #B-24-018

Dear Mr. Kohler:

Resource International, Inc. (Rii) is submitting the Phase I Environmental Site Assessment (ESA) report for the above referenced property. The users can rely on the environmental documents to meet the American Society for Testing and Materials Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment Process (ASTM E 1527–21). In accordance with ASTM E 1527-21, the Phase I ESA is valid for 180 days from the date of issuance.

We sincerely appreciate this opportunity to provide our environmental services. If you have any questions concerning this report, please do not hesitate to contact us.

Sincerely,

RESOURCE INTERNATIONAL, INC.

Michelle L Eckels

Michelle L. Eckels, CPG
Vice President - Environmental Services

Enclosure: Phase I ESA Report

ISO 9001: 2015 QMS
Committed to providing a high quality, accurate service in a timely manner

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EXECUTIVE SUMMARY

Resource International, Inc. (Rii) has performed a Phase I ESA of the subject property which consists of the ODOT Preble Full-Service Maintenance Facility located at 234 Quaker-Trace Road in West Alexandria, Ohio, in general conformance with the Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: ASTM E1527-21). Any exceptions to, or deletions from, this practice are described in Section 1.5 of this report.

RECOGNIZED ENVIRONMENTAL CONDITIONS (RECS)

This assessment has revealed the following **recognized environmental conditions (RECs)** in connection with the subject property:

- An oil/water separator, with a 2,000-gallon wastewater holding tank, was located in the garage portion of the Office Building/Garage, which flows to a 5,000-gallon wastewater holding tank. The oil/water separator and wastewater holding tanks do not discharge to the on-site septic system, and are pumped/cleaned on an as needed basis. *It is Rii's opinion that as long as the oil/water separator and holding tanks are properly maintained and operated, their presence presents a low environmental risk to the subject property.*

- One (1) 6,000-gallon aboveground storage tank (AST), storing gasoline fuel and diesel fuel, was present northeast of the Mobile Trailer. The AST is a double-walled insulated tank, which provides secondary containment for flammable liquids. A 240-gallon AST was present in the garage portion of the Office Building, and is a double-walled steel tank used to store used oil. A mobile bulk storage AST, with a 250-gallon capacity was also stored in the garage portion of the Office Building. A Spill Prevention, Control, and Countermeasure (SPCC) Plan for all aboveground storage of petroleum products was on-site and reviewed during the site reconnaissance. All aboveground storage containers are inspected on a monthly basis and emergency procedures have been established in the event of a leak or spill. *It is Rii's opinion that as long as all ASTs are properly maintained and operated, their presence presents a low environmental risk to the subject property.*

- Commercial truck batteries and battery-operated emergency exit signs were observed on the interior of the structures. Sulfuric acid and lead are used in batteries and are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is prohibited in Ohio, and these batteries are required to be recycled at a licensed facility. *It is Rii's opinion that as long as all batteries are properly maintained and recycled at end-of-life, their presence presents a low environmental risk to the subject property.*

- Numerous containers and drums of pesticides, paints, chemicals and petroleum products were observed stored throughout the facility. If these stored items are proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods. *It is Rii's opinion that as long as all chemicals-of-concern are properly stored,*

managed and disposed or recycled, their presence presents a low environmental risk to the subject property.

- Pole-mounted transformers were observed west of the Sand/Salt Barn and appeared to be in good condition at the time of the site visit, with no evidence of leaks or spills. A "Non-PCB" label was observed on the units. The electric provider is the owner of the transformers and would be responsible for any cleanup necessitated by spills or leaks of dielectric fluid from the units. *It is Rii's opinion that the presence of utility-owned transformers presents a low environmental risk to the subject property.*

- A concrete patch, indicating that a former below ground hydraulic lift was previously removed, was observed in the Garage portion of the Office Building. Older below ground lifts commonly contained pressurized vessels with hydraulic oils, with reservoirs ranging from 35-50 gallons. Hydraulic lifts can become a potential environmental concern if the lifts lose integrity and leak oil into subsurface soils. PCBs were added to hydraulic oils to prevent thermal breakdown, and were used from approximately 1929 until being banned by the EPA in 1979. It is unknown if any soil contamination was observed during the removal of the former hydraulic lift. *Due to the former presence of the below ground hydraulic lift, it is Rii's opinion that this presents a medium environmental risk to the subject property*.

- An old lubricant tank, associated with the former grease rack, was present in the Generator Room in the Office Building/Garage and depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil. If hydraulic oil has greater than 50 ppm total concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500 ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste. *Due to the presence of the old lubricant tank, it is Rii's opinion that this presents a medium environmental risk to the subject property.*

- Metal halide and fluorescent light ballasts were observed within the project area. It should be assumed all ballasts are PCB-containing unless a "No PCBs" label is identified on the ballast. Polychlorinated biphenyls (PCBs) were used in electrical oil-filled equipment such as transformers and light ballasts, until the EPA banned the manufacture and use of PCBs in 1978. According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm). Ballasts manufactured after July 1978 are required to bear a "No PCBs" label indicating that they do not contain PCBs. *It is Rii's opinion that as long as the ballasts are properly recycled or disposed of at an authorized facility, in accordance with the pertinent laws and regulations, this presents a low environmental risk to the subject property.*

- Fluorescent lamp tubes and metal halide lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Mercury float switches may be present in the oil/water separator. Float switches may contain up to 2.5 ounces of mercury, and there could be multiple switches in a sump pump. A list of suspect mercury-containing equipment is provided in Section 3.2.6 of this report. Mercury-containing equipment is considered a regulated universal waste by the EPA. The equipment should be properly recycled or disposed of at a facility which is EPA-approved for receiving mercury-containing material. *It is Rii's opinion that as long as the mercury equipment is properly recycled or disposed of at an authorized facility, in accordance with the pertinent laws and regulations, this presents a low environmental risk to the subject property*

DE MINIMIS CONDITIONS

A de minimis condition generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. **There are no de minimis conditions associated with the subject property, with the exception of the following**:

- Four (4) large plastic ASTs, ranging from 1,000 to 3,000-gallons, were observed near the Small Pump Structure and are used to store brine and beet concentrate used for deicing. The tanks were labeled to contain Beet Heet®, which is USEPA certified under the Design for the Environment (DfE) program as being a safer alternative for human health and the environment. *It is Rii's opinion that the storage of brine and beet concentrate presents a low environmental risk to the subject property.*

- A septic system was observed south of the Mobile Trailer and according to information provided by the Owner, the system is relatively new. The septic system only receives domestic sewage and does not receive any wastewater from the oil/water separator. If the septic system is to remain, it should be inspected and properly managed in accordance with local regulations. If proposed for removal as part of renovation, the septic system should be removed and properly closed by a licensed contractor. *It is Rii's opinion that the on-site septic system presents a low environmental risk to the subject property.*

CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS

A controlled REC is a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. **There are no controlled RECs associated with the subject property**.

HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS

A historical REC is a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls. This assessment has revealed

the following **historic RECs** in connection with the subject property**.**

- According to BUSTR, three (3) USTs were removed from south of the Office Building/Garage in 1998**.** Approximately 418 cubic yards of soil were removed from the tank cavity and transported off-site for bioremediation. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above BUSTR action levels. A "No Further Action" letter was issued by BUSTR on April 27, 2000, indicating that the site was known to have a LUST incident and has been remediated or determined to be of no concern to the satisfaction of the BUSTR. *It is Rii's opinion that this LUST incident presents a low environmental risk to the subject property.*

- Two (2) LUST sites were identified within 0.5-miles of the subject property.
    - Three (3) USTs were removed from the Save A Lot Gas site, located at 3266 US 35, in 1992. An unknown amount of contaminated soil was removed from the tank cavity and transported off-site for disposal. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above levels that would have significantly impacted surround soils. A "No Further Action" letter was issued by BUSTR on October 14, 1999, indicating that the site was known to have a LUST incident and has been remediated or determined to be of no concern to the satisfaction of the BUSTR. *It is Rii's opinion that this LUST incident presents a low environmental risk to the subject property.*
    - In 1994, a prospective buyer of the residence located at 33 Quin Road discovered three (3) UST fill ports on the property during a site walk-through. The previous lessor of the property disclosed that there were three (3) drinking water wells on the residence property that show signs of petroleum contamination. The status of the incident remains as "Possible Incident Reported" as the responsible party for the petroleum release has not been determined. *Due to the distance of this site from the subject property, it is Rii's opinion that this LUST incident presents a low environmental risk to the subject property*.

RECOMMENDATIONS

Based on the identified RECs, Rii recommends further environmental assessment as the following items:

- The subsurface soil in the area of the former below ground hydraulic lift (Garage portion of the Office Building) should be further assessed to determine the potential for encountering contaminated soils during construction. A Phase II ESA is recommended to include sampling of soil, and groundwater if encountered, and analysis for specific chemicals of concern. If the potential presence of contamination is not evaluated prior to construction, then environmental plan notes are recommended to be added to construction documents to alert construction contractors of the need for proper management of contaminated soil, if encountered. Excavated material found to be potentially contaminated should be analyzed, and properly managed and disposed of in accordance with applicable regulations.

- Based on the age of the Office Building/Garage, there is a potential for the old lubricant tank (in the Generator Room) to have PCB-containing lubricant hydraulic oil. The contents of should be further evaluated for waste characterization and disposal purposes prior to construction.

As required by the ASTM Standard, the qualifications of the environmental professional responsible for conducting this Phase I ESA and preparing this report are included in Appendix H. All references used to perform this Phase I ESA are included in Appendix I.

1.0 INTRODUCTION

1.1 PURPOSE

Pursuant to the agreement with Burgess & Niple, Inc. ("the user"), Resource International, Inc. (Rii) was retained to perform a Phase I Environmental Site Assessment (ESA) of the Ohio Department of Transportation (ODOT) Preble Full-Service Maintenance Facility in West Alexandria, Ohio, hereafter referred to as the "subject property". The facility is located at 234 Quaker-Trace Road in West Alexandria, Ohio. A regional location map and a site location map are provided as Figures 1 and 2 respectively, within Appendix A.

A Phase I ESA is a qualitative environmental review of a property. It is intended for use by parties seeking to understand and reduce any uncertainty about the environmental condition of commercial real estate. Use of a Phase I ESA is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner defense to the Comprehensive Environmental Response and Liability Act (CERCLA) liability: that is, the practices that constitute an all-appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice.

The goal of a Phase I ESA is to identify *recognized environmental conditions* in connection with a property. The term recognized environmental conditions (RECs) means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The property is evaluated with regards to its existing condition to determine the likelihood that such events have occurred. If the Phase I ESA concludes or reasonably implies environmental conditions may be affecting the property in question, then further evaluation may be warranted. This follow-up level of investigation, if necessary, is referred to as a Phase II ESA. Refer to Appendix C for a glossary of terms and acronyms.

1.2 DETAILED SCOPE OF SERVICES

This Phase I ESA was performed in general conformance with the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: ASTM E1527-21). A Phase I ESA has four (4) components:

1. *Records Review* - review state, federal or local government records that will help identify RECs in connection with the subject property.
2. *Site Reconnaissance* - visit the property to obtain information indicating the

likelihood of identifying RECs in connection with the subject property.

3. *Interviews* - interview with current owner(s) or occupant(s), or other persons whom have knowledge of the property history to identify RECs in connection with the subject property.
4. *Evaluation and Report* - report of findings for the Phase I ESA.

1.2.1 RECORDS REVIEW

Available records, documents, maps, aerial photographs and historic uses of the subject property were reviewed for possible activities that may have adversely impacted the environmental condition of the property. To complete the environmental record search, a database search report was obtained from Environmental Data Resources, Inc. (EDR). An extensive review of Federal, State, Local and Tribal environmental databases and additional local databases were reviewed for the property and vicinity. Environmental incidents involving adjacent properties were examined and evaluated in relation to possible impact(s) to the target property. Refer to Section 4.0 for information regarding the available records reviewed for identification of historical impacts relative to the property. A copy of the EDR report is provided in Appendix E.

1.2.2 SITE RECONNAISSANCE

The subject property was inspected to identify signs of the presence of hazardous substances and/or petroleum products. Areas within the subject property that may have at one time been exposed to hazardous substances or petroleum products were noted. Visual signs of such areas include:

- discolored or stained soil or pavement;
- stressed vegetation or absence of vegetation;
- unusual topography including mounds and depressions;
- stained or discolored liquids (i.e., sheens);
- exposed fill and vent pipes associated with underground storage tanks (USTs);
- discolored or unusual seepage;
- polychlorinated biphenyl (PCB) visual indicators such as electrical transformers or capacitors.

Current activities within the adjacent properties and surrounding area were reviewed to determine practices that may indicate possible sources of contamination. Observations were recorded and evaluated. Special attention was given to any existing sanitary and storm sewers, manholes, other utilities, transportation rights-of-way, solid waste disposal sites, construction or demolition debris, structures, surface water, and groundwater wells. Refer to Section 3.2 for a description of observations noted during the site

reconnaissance.

1.2.3 INTERVIEWS

Reasonable efforts were made to contact the person(s) affiliated with the current property use for additional information regarding current or past activities, conditions, and management practices that would indicate the possibility of contamination within the property or adjoining properties.

1.3 SIGNIFICANT ASSUMPTIONS

There were no significant assumptions made during the development of this Phase I ESA.

1.4 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

1.4.1 LIMITATIONS

The subject property was accessible at the time of the site reconnaissance. There were no accessibility limitations.

1.4.2 EXCEPTIONS

There is one (1) deviation from the ASTM Standard in this report.

- The report format outlined in Section X4 of the Standard deviates from the standard. The format of this report is not as outlined in the Standard; however, this report presents the same information.

Excluded from this assessment are sampling and testing of building materials, surface soil, subsurface soil, air, surface water, and groundwater on the property for hazardous substances and petroleum products. This assessment does not include specific sampling or analysis regarding the potential presence of asbestos-containing materials and lead-based paint. Radon and wetland evaluations are also excluded from this Phase I ESA.

As part of the due diligence process, the environmental professional is tasked with conducting the appropriate level of inquiry for each individual property. An inquiry is considered appropriate even though the findings did not completely eliminate all uncertainty regarding the environmental condition of the property. The environmental professional must balance the requirement for obtaining reliable, reasonably ascertainable information, while limiting the cost and time demands on a client.

1.5 SPECIAL TERMS AND CONDITIONS

There are no special terms or conditions associated with this Phase I ESA.

1.6 USER RELIANCE

This report and other instruments of service are prepared for, and made available for the sole use of the users, Burgess & Niple, Inc, ODOT, and the Ohio Facilities Construction Commission (OFCC), the contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Rii. Notwithstanding the foregoing to the contrary, Rii's report may be used by the users in securing financing and/or refinancing for the property and thus as such may be presented to and relied upon by the lender. At the request of the users, Rii shall issue to the user and/or lender a letter or equivalent document recognizing the right of the developer and/or lender to rely upon this report.

1.7 PHASE I ESA VIABILITY

This Phase I ESA is viable within 180 days prior to the date of acquisition, which is the date on which a person acquires title or easement to the property or (for transactions not involving an acquisition) the date of the intended transaction presumed to be valid.

This Phase I ESA can be utilized by a subsequent user as component of information for a Phase I ESA or Updated Phase I ESA, provided the provisions in the ASTM E1527-21 Section 4.6 are met, within 180 days of the date of purchase or the date of the intended transaction.

2.0 USER PROVIDED INFORMATION

2.1 TITLE RECORDS

A copy of the current Preble County parcel map and survey of the subject property is provided in Appendix D.

TABLE 1 – SUBJECT PROPERTY IDENTIFICATION

Parcel #	Property Owner & Address	Building Size (square feet)	Year Built
H25530510000017000	State of Ohio 234 Quaker-Trace Rd West Alexandria, Ohio	Office Building/Garage – 15,642	1972
		Salt Building (Dome) – 8,020	1980
		Sand/Salt Building – 2,208	1972
		Mobile Trailer - 660	2011
		Pole Barn – 3,160	1972
		Small Pump Structure - 120	2011

2.2 ENVIRONMENTAL LIENS

The users did not report any environmental liens encumbering the subject property.

2.3 SPECIALIZED KNOWLEDGE

The users did not report any specialized knowledge regarding RECs in connection with the subject property.

2.4 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

The users did not report a valuation reduction due to environmental issues in connection with the subject property.

2.5 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

The users provided information regarding the parcel owners, parcel boundaries, and parcel numbers.

2.6 REASON FOR PERFORMING PHASE I ESA

The users have requested this Phase I ESA as a means of showing environmental due diligence prior to authorizing property ownership transfer and/or development purposes. In addition, this ESA has been performed to evaluate and provide information regarding

the potential for encountering environmental hazards associated with releases to soil and/or groundwater.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The current property owner is provided in Table 2. The subject property is located in Preble County, Ohio.

TABLE 2 – SUBJECT PROPERTY SUMMARY

Parcel #	Property Owner & Address	Property Acreage	Land Use
H25530510000017000	State of Ohio 234 Quaker-Trace Road West Alexandria, Ohio	18.84	Exempt – State owned

3.2 SITE RECONNAISSANCE

Katie Bossert, Rii Environmental Specialist, conducted the site reconnaissance on August 12, 2024. Scott Shuler, ODOT Preble County Transportation Administrator, was present during the site reconnaissance. Photographs taken during the site reconnaissance are provided in Appendix B.

3.2.1 EXISTING PROPERTY CONDITIONS

The subject property consists of 18.84 acres and is currently operated and maintained by ODOT as a maintenance facility for fleet vehicles and snow plows. The facility contains six (6) structures on the southern half of the subject property, and the remaining north half of the subject property is maintained as grass-covered undeveloped land.

The existing structures evaluated as a part of this assessment include the following:

- *Office Building/Garage*: The Office Building/Garage consists of a single-story structure and was built in 1972. Functional spaces within the 15,642 square-foot building consist of offices, locker rooms, break rooms, garages, storage and utility rooms.
- *Salt Building (Dome)*: The Salt Dome is an 8,020 square-foot circular structure that provides salt storage to the facility and was built in 1980.
- *Sand/Salt Building*: The Sand/Salt Building is a 2,208 square-foot wooden structure that provides sand and salt storage to the facility and was built in 1972.
- *Mobile Trailer:* The 660 square-foot Mobile Trailer consists of several office spaces and is located south of the Office Building/Garage. According to the Preble County

Auditor, the Mobile Trailer was placed on the subject property in 2011.

- *Pole Barn*: The Pole Barn is a 3-sided 3,160 square foot structure built in 1972, and is used for storage of traffic control cones, snow plow attachments, and trailers.
- *Small Pump Structure*: The Small Pump Structure is a 120 square-foot pre-fabricated fiberglass enclosure installed on a concrete pad, that houses a transfer pump for the brine and beet concentrate used for deicing. According to the Preble County Auditor, the Small Pump Structure was placed on the subject property in 2011.

3.2.2 UTILITIES

- Electricity & Gas – Electric services are provided by AES Ohio, and natural gas services are provided by CenterPoint Energy of Ohio.

- Water and Sewer – The subject property is serviced by the Village of West Alexandria Department of Water and Refuse Collection. A septic system was observed south of the Mobile Trailer and according to information provided by the Owner, the system is relatively new. The septic system only receives domestic sewage and does not receive any wastewater from the oil/water separator. If the septic system is to remain, it should be inspected and properly managed in accordance with local regulations. If proposed for removal as part of renovation, the septic system should be removed and properly closed by a licensed contractor.

3.2.3 UNDERGROUND STORAGE TANKS (USTS)

According to the Bureau of Underground Storage Tank regulations (BUSTR), three (3) USTs were removed from the subject property in 1998 and is further discussed in Section 4.1.1 of this report. An oil/water separator, with a 2,000-gallon wastewater holding tank, was located in the garage portion of the Office Building/Garage, which flows to a 5,000-gallon wastewater holding tank. The oil/water separator and wastewater holding tanks are pumped/cleaned on an as needed basis.

3.2.4 ABOVEGROUND STORAGE TANKS (ASTS)

One (1) 6,000-gallon aboveground storage tank (AST), storing gasoline fuel and diesel fuel, was present northeast of the Mobile Trailer. The AST is a double-walled insulated tank, which provides secondary containment for flammable liquids. A 240-gallon AST was present in the garage portion of the Office Building, and is a double-walled steel tank used to store used oil. A mobile bulk storage AST, with a 250-gallon capacity, was also stored in the garage portion of the Office Building. A Spill Prevention, Control, and

Countermeasure (SPCC) Plan for all aboveground storage of petroleum products was on-site and reviewed during the site reconnaissance. All aboveground storage containers are inspected on a monthly basis and emergency procedures have been established in the event of a leak or spill.

Four (4) large plastic ASTs, ranging from 1,000 to 3,000-gallons, were observed near the Small Pump Structure and are used to store brine and beet concentrate used for deicing. The tanks were labeled to contain Beet Heet®, which is USEPA certified under the Design for the Environment (DfE) program as being a safer alternative for human health and the environment.

3.2.5 SOLID WASTE

Two (2) general municipal waste dumpsters were located east of the Office Building/Garage. One (1) Rumpke closed box dumpster utilized for tire disposal was located north of the Salt Dome. Minimal evidence of littering was observed at the time of the site reconnaissance.

3.2.6 HAZARDOUS MATERIALS

Commercial truck batteries and battery-operated emergency exit signs were observed on the interior of the structures. Sulfuric acid and lead are used in batteries and are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is prohibited in Ohio, and these batteries are required to be recycled at a licensed facility.

Numerous containers and drums of pesticides, paints, chemicals and petroleum products were observed stored throughout the facility. If these stored items are proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods.

Pole-mounted transformers were observed west of the Sand/Salt Barn and appeared to be in good condition at the time of the site visit, with no evidence of leaks or spills. A “Non-PCB” label was observed on the units. The electric provider is the owner of the transformers and would be responsible for any cleanup necessitated by spills or leaks of dielectric fluid from the units.

A concrete patch, indicating that a former below ground hydraulic lift was previously removed, was observed in the Garage portion of the Office Building. Older below ground lifts commonly contained pressurized vessels with hydraulic oils, with reservoirs ranging from 35-50 gallons. Hydraulic lifts can become a potential environmental concern if the

lifts lose integrity and leak oil into subsurface soils. PCBs were added to hydraulic oils to prevent thermal breakdown, and were used from approximately 1929 until being banned by the EPA in 1979. It is unknown if any soil contamination was observed during the removal of the former hydraulic lift.

An old lubricant tank associated with the former grease rack was present in the Generator Room in the Office Building/Garage. Depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil. If hydraulic oil has greater than 50 ppm total concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500 ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste.

Metal halide and fluorescent light ballasts were observed within the project area. It should be assumed all ballasts are PCB-containing unless a “No PCBs” label is identified on the ballast. Polychlorinated biphenyls (PCBs) were used in electrical oil-filled equipment such as transformers and light ballasts, until the EPA banned the manufacture and use of PCBs in 1978. According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm). Ballasts manufactured after July 1978 are required to bear a “No PCBs” label indicating that they do not contain PCBs.

Fluorescent lamp tubes and metal halide lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Fluorescent lamp tubes are considered a regulated universal waste by the EPA. Mercury float switches may be present in the oil/water separator. Float switches may contain up to 2.5 ounces of mercury, and there could be multiple switches in a sump pump. The following suspect mercury equipment were identified within the project area:

- Fluorescent lamp tubes;
- Metal halide lamps;
- Mercury thermostats;
- Mercury float switches; and
- Equipment gages and switches.

3.2.7 ADJOINING PROPERTIES

The subject property is located in a semi-rural region in West Alexandria, Ohio. The

adjacent land uses were as follows:

- North – An auto and RV facility is present to the north.
- South – Residential dwellings, with agricultural land beyond.
- East – A residential neighborhood is present to the east.
- West – Residential dwellings, with agricultural land beyond.

3.3 PHYSICAL SETTING

3.3.1 TOPOGRAPHY

Based on the United States Geological Survey (USGS) Topographic Map of the West Alexandria, Ohio Quadrangle, the topography in the vicinity of the subject property and surrounding area is characterized as having low relief. The land generally slopes to the east towards Bantas Fork Creek. The surface elevation in the vicinity of the subject property is approximately 977 feet above mean sea level (msl).

3.3.2 SURFICIAL DEPOSITS

The subject property lies within the Southern Ohio Loamy Till Plain which has a surface of loamy till; end and recessional moraines, commonly associated with boulder belts, between relatively flat-lying ground moraine, cut by steep-valleyed large streams; stream valleys filled with outwash and alternate between broad floodplains and narrows with buried valleys common.

Based on the USDA Natural Resource Conservation Service Custom Soil Resource Report of Fayette County, several soil types make up the subject property, as follows:

- CeB – Celina silt loam, 2-6% slopes. Loess derived from quartzite over loamy till derived from limestone and dolomite. Moderately well drained, and non-hydric.
- CtA – Crosby-Celina silt loams, 0-2% slopes. Loess over loamy till; somewhat poorly drained, and non-hydric.
- KnA – Kokomo silt loam, 0-1% slopes. Loamy glaciofluvial deposits over loam till; very poorly drained, and a hydric soil.
- MfB2 – Miamian-Celina silt loams, 2-6% slopes, eroded. Loess over loamy till; well drained, and non-hydric.

A copy of the USDA Natural Resource Conservation Service soil map is provided in

Appendix D.

3.3.3 BEDROCK GEOLOGY

Based on bedrock geology and topography maps of the area from the Ohio Department of Natural Resources (ODNR), the underlying bedrock at the project site consists of the Ordovician-aged Drakes Formation, Whitewater Formation, and Liberty Formation, undivided. This unit is comprised of gray to yellowish gray, to maroon interbedded shale and limestone. The unit features deposition of multiple sedimentary cycles of shale and limestone displaying planar to irregular bedding, and limestone and shale exhibiting wavy to nodular bedding, and ranges between 60 to 150 feet thick. According to ODNR bedrock topography mapping, the bedrock surface in the vicinity of the site is at an approximate elevation of 900± feet, which is approximately 77 feet below the existing surface grade.

3.3.4 GROUNDWATER

According to the Ground-Water Resources Map of Preble County, thick deposits of clay with thin lenses of sand and gravel may yield as much as 10 gallons per minute to screened wells. Depths to bedrock generally range from 70 to 150 feet. Wells not encountering sand and gravel produce less than three gallons per minute from the underlying limey shale.

According to the ODNR Water Well database, there is one (1) water well recorded for on the northwest portion of the subject property. The well log report for Well No. 966737 was obtained from ODNR, and appears to have been mislocated on the subject property. According to the well log report, the well is owned by Habitat for Humanity and was drilled in 2007 as a domestic water well for the residence located at 86 Quaker Trace Road. Google Earth places the well at a residence on the northeast adjacent property.

Image No. 1: Actual location of mislocated Well No. 966737.

3.3.5 SURFACE WATER

No surface water was present on the subject property. The surface topography is relatively flat and is partially gravel-covered surrounded by manicured grass areas. The National Wetlands Inventory (NWI) database was reviewed, no wetlands were mapped on the subject property. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), the Property is located in Zone X – area of minimal flood hazard.

Copies of the USGS topographic map, NRCS Soil Survey, Preble County Groundwater Resources Map, ODNR Water Well Logs, ODNR Oil & Gas Well Map, and NWI map are all included in Appendix D.

4.0 RECORDS REVIEW

4.1 ENVIRONMENTAL DATABASE RECORDS

Rii obtained a comprehensive listing of sites found within Federal, State, Local and Tribal databases from Environmental Data Resources (EDR). A summary of information obtained from EDR, which meets or exceeds the ASTM minimum search distances from the subject property, is presented in the following paragraphs. Refer to Appendix E for the complete EDR Report. See Table 2 below for the summary of the environmental database findings.

TABLE 3 – SUMMARY OF DATABASE RESULTS

No.	Database	Adjusted Search Radius	Number of Sites
Federal NPL Site List			
1	NPL/Delisted NPL/NPL Liens	1.00-mile	0
Federal CERCLIS List			
2	CERCLIS	0.50-mile	0
3	CERCLIS NFRAP	0.50-mile	0
Federal RCRA List			
4	RCRA TSDF	0.50-mile	0
5	RCRA CORRACTS	1.00 mile	0
6	RCRA-LQG (Large Quantity Generator)	Property and adjoining properties	0
7	RCRA-SQG (Small Quantity Generator)	Property and adjoining properties	0
8	RCRA VSQG (Very Small Quantity Generator)	Property and adjoining properties	0
Federal Engineering & Institutional Controls List			
9	US ENG CONTROLS	0.50-mile	0
10	US INST CONTROLS	0.50-mile	0
Federal ERNS List			
11	ERNS	Subject Property only	0
State Lists			
12	DERR	Property and adjoining properties	0
13	State Landfill	0.50-mile	0
14	LUST	0.50-mile	3
15	UST	Property and adjoining properties	2
16	HIST INST Controls	Property and adjoining properties	0
17	INST Controls	Subject Property only	0
18	VCP	0.50-mile	0

4.1.1 ASTM FEDERAL, STATE, AND TRIBAL RECORDS

1. National Priorities List (NPL): There are **no NPL, Delisted NPL, or NPL LIENS sites** identified on the subject property or within 1.0-mile of the subject property.

2. Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS): There are **no active CERCLIS** facility sites identified on the subject property or within 0.5-mile of the subject property.

3. Comprehensive Environmental Response, Compensation, and Liability Information Systems – No Further Remedial Action Planned (CERCLIS NFRAP): There are **no CERCLIS NFRAP** facility sites identified within 0.5-mile of the subject property.

4. Resource Conservation and Recovery Information System Treatment, Storage, and Disposal Facilities (RCRA TSDF): There are **no RCRA TSDF** facilities identified on the subject property or within 0.5-mile of the subject property.

5. Resource Conservation and Recovery Information System Corrective Action (RCRA CORRACTS): There are **no RCRA CORRACTS** facilities identified on the subject property or within 1.0-mile of the subject property.

6. Resource Conservation and Recovery Information System – Large Quantity Generator (RCRA-LQG): There are **no RCRA-LQG facilities** identified on the subject property or the adjacent areas.

7. Resource Conservation and Recovery Information System – Small Quantity Generator (RCRA-SQG): There are **no RCRA-SQG facilities** identified on the subject property or the adjacent areas.

8. Resource Conservation and Recovery Information System – Very Small Quantity Generator (RCRA-VSQG): There were **no RCRA-VSQG facilities** identified on the subject property or adjacent to the subject property.

9. US Engineering Controls (US ENG CONTROLS): There are **no US ENG CONTROLS facilities** identified on the subject property or within 0.5-mile of the subject property.

10. US Institutional Controls (US INST CONTROLS): There are **no US INST CONTROLS facilities** identified on the subject property or within 0.5-mile of the subject property.

11. Emergency Response and Notification System (ERNS): The subject property is **not identified under ERNS**.

12. Division of Emergency & Remedial Response Database Report (DERR): A review determined there were **no DERR sites** identified on the subject property or adjacent to the subject property.

13. State Landfill: There are **no State Landfill sites** identified on the subject property or within 0.5-mile of the subject property.

14. Ohio Leaking Underground Storage Tank List (LUST): There are **three (3) LUST sites** identified within 0.5 miles of the subject property.

TABLE 4 – LUST

Site	Distance	Facility ID	Status
ODOT Preble County 234 Quaker Trace Rd	Subject Property	68000101	No Further Action
Save A Lot Gas 3266 US 35	0-1/8 mi SE	68009660	No Further Action
Residence 33 Quinn Road	1/8-1/4 mi SE	68009663	Possible Incident Reported

ODOT Preble County Garage: According to the Bureau of Underground Storage Tank Regulations (BUSTR) file review, three (3) USTs were removed from the subject property in 1998. The former USTs were located south of the Office Building/Garage. The removed USTs consisted of an 8,000-gallon diesel tank, a 2,000-gallon gasoline tank, and a 1,000-gallon waste oil tank. Approximately 418 cubic yards of soil were removed from the tank cavity and transported off-site for bioremediation. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above BUSTR action levels. A “No Further Action” letter was issued by BUSTR on April 27, 2000.

Save A Lot Gas: According the BUSTR file review, three (3) USTs were removed from the property in 1992. The USTs consisted of a 2,000-gallon UST, a 4,000-gallon UST, and a 6,000-gallon UST. An unknown amount of contaminated soil was removed from the tank cavity and transported off-site for disposal. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above levels that would have significantly impacted surround soils. A “No Further Action” letter was issued by BUSTR on October 14, 1999.

Residence at 33 Quin Road: According to the BUSTR file review, in 1994 a

prospective buyer of the residence discovered three (3) UST fill ports on the property during a site walk-through. The previous lessor of the property disclosed that there were three (3) drinking water wells on the residence property that show signs of petroleum contamination. The status of the incident remains as "Possible Incident Reported" as the responsible party for the petroleum release has not been determined.

15. Underground Storage Tank List (UST): There are **two (2) UST facilities** identified within 0.5 mile of the subject property.

TABLE 5 – UST

Site	Distance	Facility ID	Status
ODOT Preble County 234 Quaker Trace Rd	Subject Property	68000101	3 USTs removed 0 USTs currently in use
Save A Lot Gas 3266 US 35	0-1/8 mi SE	68009660	3 USTs removed 0 USTs currently in use

16. Ohio Historical Institutional Controls (HIST INST Controls): There are **no historical institutional controls** identified on the subject property or adjacent to the subject property.

17. Ohio Institutional Engineering Controls (INST Controls): There are **no institutional engineering controls facility** identified near the subject property.

18. Voluntary Action Program Sites (VCP): There are **no VCP sites** identified on the subject property or within 0.5-mile of the subject property.

4.1.2 ASTM LOCAL RECORDS

Local records were reviewed adjacent to the subject property, and no sites were identified on the databases on the subject property or adjacent to the subject property. The following is a list of local and other databases that were reviewed.

- Reported Spills (OH SPILLS)
- LIENS 2 (CERCLA Land Liens)
- Brownfield Sites (US BROWNFIELDS)
- State Institutional Controls (INST CONTROL)
- State Institutional Engineering Controls (ENG CONTROL)
- Ohio Brownfield Inventory (BROWNFIELDS)
- Historical Cleaners
- Historical Auto Station

- Historical USD (Urban Setting Designations Database)
- Historical Landfill

No sites were identified in the local database search.

4.2 HISTORICAL USE INFORMATION

Uses of historical records are primarily for identification of changes in physical site characteristics or historical uses and may not accurately represent site features present at the specified date(s). Representations and information provided in the historical topographic maps, city directories, Sanborn Fire Insurance Maps and historical aerials may not correlate to one another due to insufficient information or changes in site features.

4.2.1 HISTORICAL TOPOGRAPHIC MAPS

Copies of the historical topographic maps were obtained from the EDR Historical Topographic Maps database. The scales of the historical topographic maps range from 1:24,000 to 1:125,000. Copies of the historical topographic maps are provided in Appendix F.

TABLE 6 – HISTORICAL TOPOGRAPHIC MAP SUMMARY

Year	Property Use	Adjacent Property Use
1907-1911	The historical topographic map does not show structures on the property, and the property appears to be agricultural land. Quaker Trace Road is present to the west of the subject property.	The surrounding area appears to be agricultural land with residential structures.
1961	The historical topographic map does not show structures on the property.	The surrounding area appears to be agricultural land with residential structures.
1987	Four (4) structures are depicted on the historical topographic map, and appear to consist of the Office/Garage, Salt Dome, Sand/Salt building and the Pole Barn.	The surrounding area appears to be agricultural land with residential structures.
2013 - 2019	No significant changes are apparent on the property.	The surrounding area appears to be agricultural land with residential structures.

4.2.2 CITY DIRECTORIES

City Directory Abstract includes a search of available city directory data. Yearly published city directories identify subject property occupant or company name by reference to the street addresses. The EDR City Directory Database report is provided in Appendix F.

TABLE 7 – CITY DIRECTORY REVIEW

ADDRESS	OCCUPANT & USES	YEARS
234 Quaker-Trace Rd	Ohio Department of Transportation	1992 - 2010

4.2.3 *SANBORN FIRE INSURANCE MAPS*

Sanborn Fire Insurance Map data coverage was reviewed by EDR. The Certified Sanborn Map Report indicated that the subject property is an unmapped property; thus, no information could be gathered from this source. Refer to the Certified Sanborn Map Report provided in Appendix F.

4.2.4 *HISTORICAL AERIAL PHOTOGRAPHS*

Available historical aerial photographs were obtained from EDR. The photographs available include 1948 through 2019. Copies of the aerial photographs are provided in Appendix F.

1948-1959
The subject property consists of agricultural land, with residential structures located throughout the surrounding area. The ODOT Preble Full-Service Maintenance Facility has not yet been constructed.

1974-1979
The Office Building/Garage, Sand/Salt Building, and Pole Barn are now present on the subject property. The surrounding area consists of a mix of agricultural land and residential structures.

1984-2000
The Salt Building (dome) is now present on the subject property. The surrounding area appears to remain the same.

2006
The subject property appears to remain the same. The auto and RV facility is now present north of the subject property.

2011-2019
The Mobile Trailer and Small Pump Structure are now present on the subject property. The surrounding area appears to remain the same.

5.0 INTERVIEWS

5.1 LOCAL FIRE DEPARTMENT

The West Alexandria Fire Department was contacted on August 6, 2024 concerning any health hazardous, fire responses, environmental complaints, or spills. No response has been received at the time this report was generated. The request letter can be found in Appendix G.

5.2 LOCAL HEALTH DEPARTMENT

The Preble County Public Health was contacted on August 6, 2024 concerning any health hazardous, environmental complaints, or spills. A response was received on August 6, 2024 from Ms. Angie Willard, from the Preble County Public Health. Ms. Willard stated that there were no records of health hazards or environmental complaints for the subject property. The response letter can be found in Appendix G.

5.3 INTERVIEW WITH OWNER/OPERATOR

A Phase I ESA Questionnaire was completed by Mr. Scott Schuler, County Manager. Mr. Schuler stated that the property has been used as the ODOT full-service maintenance facility since the 1970s. Mr. Schuler stated there are aboveground storage tanks on the subject property, containing diesel and gasoline fuel. Mr. Schuler stated that there are on-site chemicals stored, and an SPCC plan is in place for stored chemicals. Mr. Schuler is unaware of historic spills or environmental cleanups that may have occurred on the property. A copy of the completed questionnaire is provided in Appendix G.

6.0 DATA GAPS

A Phase I ESA must identify and comment on significant data gaps that affect the Environmental Professional to identify RECs. A data gap is only significant if other information and/or professional experience raises reasonable concerns involving the data gap. Many of the historical document records (i.e., aerial photos, city directory search, topographic maps, Sanborn maps, etc.) are only available at five (5) year or greater intervals.

Based on historical source reviews of the current properties, Rii has determined that the subject property was originally agricultural and vacant land until the early 1970's when the maintenance facility was constructed. There are no significant data gaps, which would cause concern for the site area use or a change in land use.

7.0 FINDINGS AND CONCLUSIONS

7.1 ASTM SCOPE ITEMS

Resource International, Inc. (Rii) has performed a Phase I ESA of the subject property which consists of the ODOT Preble Full-Service Maintenance Facility located at 234 Quaker-Trace Road in West Alexandria, Ohio in general conformance with the Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: ASTM E1527-21). Any exceptions to, or deletions from, this practice are described in Section 1.5 of this report.

7.1.1 RECOGNIZED ENVIRONMENTAL CONDITIONS (RECS)

This assessment has revealed the following **recognized environmental conditions (RECs)** in connection with the subject property:

- An oil/water separator, with a 2,000-gallon wastewater holding tank was located in the garage portion of the Office Building/Garage, which flows to a 5,000-gallon wastewater holding tank. The oil/water separator and wastewater holding tanks do not discharge to the on-site septic system, and are pumped/cleaned on an as needed basis. *It is Rii's opinion that as long as the oil/water separator and holding tanks are properly maintained and operated, their presence presents a low environmental risk to the subject property.*

- One (1) 6,000-gallon aboveground storage tank (AST), storing gasoline fuel and diesel fuel, was present northeast of the Mobile Trailer. The AST is a double-walled insulated tank, which provides secondary containment for flammable liquids. A 240-gallon AST was present in the garage portion of the Office Building, and is a double-walled steel tank used to store used oil. A mobile bulk storage AST, with a 250-gallon capacity was also stored in the garage portion of the Office Building. A Spill Prevention, Control, and Countermeasure (SPCC) Plan for all aboveground storage of petroleum products was on-site and reviewed during the site reconnaissance. All aboveground storage containers are inspected on a monthly basis and emergency procedures have been established in the event of a leak or spill. *It is Rii's opinion that as long as all ASTs are properly maintained and operated, their presence presents a low environmental risk to the subject property.*

- Commercial truck batteries and battery-operated emergency exit signs were observed on the interior of the structures. Sulfuric acid and lead are used in batteries and are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is

prohibited in Ohio, and these batteries are required to be recycled at a licensed facility. *It is Rii's opinion that as long as all batteries are properly maintained and recycled at end-of-life, their presence presents a low environmental risk to the subject property.*

- Numerous containers and drums of pesticides, paints, chemicals and petroleum products were observed stored throughout the facility. If these stored items are proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods. *It is Rii's opinion that as long as all chemicals-of-concern are properly stored, managed and disposed or recycled, their presence presents a low environmental risk to the subject property.*

- Pole-mounted transformers were observed west of the Sand/Salt Barn and appeared to be in good condition at the time of the site visit, with no evidence of leaks or spills. A "Non-PCB" label was observed on the units. The electric provider is the owner of the transformers and would be responsible for any cleanup necessitated by spills or leaks of dielectric fluid from the units. *It is Rii's opinion that the presence of utility-owned transformers presents a low environmental risk to the subject property.*

- A concrete patch, indicating that a former below ground hydraulic lift was previously removed, was observed in the Garage portion of the Office Building. Older below ground lifts commonly contained pressurized vessels with hydraulic oils, with reservoirs ranging from 35-50 gallons. Hydraulic lifts can become a potential environmental concern if the lifts lose integrity and leak oil into subsurface soils. PCBs were added to hydraulic oils to prevent thermal breakdown, and were used from approximately 1929 until being banned by the EPA in 1979. It is unknown if any soil contamination was observed during the removal of the former hydraulic lift. *Due to the former presence of the below ground hydraulic lift, it is Rii's opinion that this presents a medium environmental risk to the subject property*.

- An old lubricant tank, associated with the former grease rack, was present in the Generator Room in the Office Building/Garage and depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil. If hydraulic oil has greater than 50 ppm total concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500

ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste. *Due to the presence of the old lubricant tank, it is Rii's opinion that this presents a medium environmental risk to the subject property.*

- Metal halide and fluorescent light ballasts were observed within the project area. It should be assumed all ballasts are PCB-containing unless a "No PCBs" label is identified on the ballast. Polychlorinated biphenyls (PCBs) were used in electrical oil-filled equipment such as transformers and light ballasts, until the EPA banned the manufacture and use of PCBs in 1978. According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm). Ballasts manufactured after July 1978 are required to bear a "No PCBs" label indicating that they do not contain PCBs. *It is Rii's opinion that as long as the ballasts are properly recycled or disposed of at an authorized facility, in accordance with the pertinent laws and regulations, this presents a low environmental risk to the subject property.*

- Fluorescent lamp tubes and metal halide lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Mercury float switches may be present in the oil/water separator. Float switches may contain up to 2.5 ounces of mercury, and there could be multiple switches in a sump pump. A list of suspect mercury-containing equipment is provided in Section 3.2.6 of this report. Mercury-containing equipment is considered a regulated universal waste by the EPA. The equipment should be properly recycled or disposed of at a facility which is EPA-approved for receiving mercury-containing material. *It is Rii's opinion that as long as the mercury equipment is properly recycled or disposed of at an authorized facility, in accordance with the pertinent laws and regulations, this presents a low environmental risk to the subject property.*

7.1.2 DE MINIMIS CONDITIONS

A de minimis condition generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. **There are no de minimis conditions associated with the subject property, with the exception of the following**:

- Four (4) large plastic ASTs, ranging from 1,000 to 3,000-gallons, were observed near the Small Pump Structure and are used to store brine and beet concentrate used for deicing. The tanks were labeled to contain Beet Heet®, which is USEPA certified under the Design for the Environment (DfE) program as being a safer alternative for human health and the environment. *It is Rii's opinion that the storage*

of brine and beet concentrate presents a low environmental risk to the subject property.

- A septic system was observed south of the Mobile Trailer and according to information provided by the Owner, the system is relatively new. The septic system only receives domestic sewage and does not receive any wastewater from the oil/water separator. If the septic system is to remain, it should be inspected and properly managed in accordance with local regulations. If proposed for removal as part of renovation, the septic system should be removed and properly closed by a licensed contractor. *It is Rii's opinion that the on-site septic system presents a low environmental risk to the subject property.*

7.1.3 CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS

A controlled REC is a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls. **There are no controlled RECs associated with the subject property**.

7.1.4 HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS

A historical REC is a past release of any hazardous substances or petroleum products that has occurred in connection with the subject property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls. This assessment has revealed the following **historic RECs** in connection with the subject property**.**

- According to BUSTR, three (3) USTs were removed from south of the Office Building/Garage in 1998**.** Approximately 418 cubic yards of soil were removed from the tank cavity and transported off-site for bioremediation. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above BUSTR action levels. A "No Further Action" letter was issued by BUSTR on April 27, 2000, indicating that the site was known to have a LUST incident and has been remediated or determined to be of no concern to the satisfaction of the BUSTR. *It is Rii's opinion that this LUST incident presents a low environmental risk to the subject property.*

- Two (2) LUST sites were identified within 0.5-miles of the subject property.
    - Three (3) USTs were removed from the Save A Lot Gas site, located at

3266 US 35, in 1992. An unknown amount of contaminated soil was removed from the tank cavity and transported off-site for disposal. Analytical results from soil samples collected from the tank cavity indicated no chemicals-of-concern above levels that would have significantly impacted surround soils. A “No Further Action” letter was issued by BUSTR on October 14, 1999, indicating that the site was known to have a LUST incident and has been remediated or determined to be of no concern to the satisfaction of the BUSTR. *It is Rii’s opinion that this LUST incident presents a low environmental risk to the subject property.*

- In 1994, a prospective buyer of the residence located at 33 Quin Road discovered three (3) UST fill ports on the property during a site walk-through. The previous lessor of the property disclosed that there were three (3) drinking water wells on the residence property that show signs of petroleum contamination. The status of the incident remains as “Possible Incident Reported” as the responsible party for the petroleum release has not been determined. *Due to the distance of this site from the subject property, it is Rii’s opinion that this LUST incident presents a low environmental risk to the subject property*.

8.0 RECOMMENDATIONS

Based on the identified RECs, Rii recommends further environmental assessment as the following items:

- The subsurface soil in the area of the former below ground hydraulic lift (Garage portion of the Office Building) should be further assessed to determine the potential for encountering contaminated soils during construction. A Phase II ESA is recommended to include sampling of soil, and groundwater if encountered, and analysis for specific chemicals of concern. If the potential presence of contamination is not evaluated prior to construction, then environmental plan notes are recommended to be added to construction documents to alert construction contractors of the need for proper management of contaminated soil, if encountered. Excavated material found to be potentially contaminated should be analyzed, and properly managed and disposed of in accordance with applicable regulations.

- Based on the age of the Office Building/Garage, there is a potential for the old lubricant tank (in the Generator Room) to have PCB-containing lubricant hydraulic oil. The contents of should be further evaluated for waste characterization and disposal purposes prior to construction.

As required by the ASTM Standard, the qualifications of the environmental professional responsible for conducting this Phase I ESA and preparing this report are included in Appendix H. All references used to perform this Phase I ESA are included in Appendix I.

9.0 RELIABILITY OF REPORT – DISCLAIMER

Conclusions reached in this report are based upon the objective data available to Rii at the time of forming our opinions and as presented in this report. The accuracy of this report depends upon the accuracy of the data. Every effort is made to evaluate the information by the methods that are generally recognized to constitute the State of the Art at the time of rendering the report and conclusions, and the conclusions reached herein represent our opinions. Rii is not responsible for actual conditions proved to be materially at variance with the data that was available to us and upon which we relied, as presented in this report.

10.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL(S)

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312, and we have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Kristy Engel-Shepard
Environmental Project Manager

Katherine Bossert
Environmental Specialist

Michelle L. Eckels, CPG
Vice President – Environmental Services

APPENDIX A

FIGURES

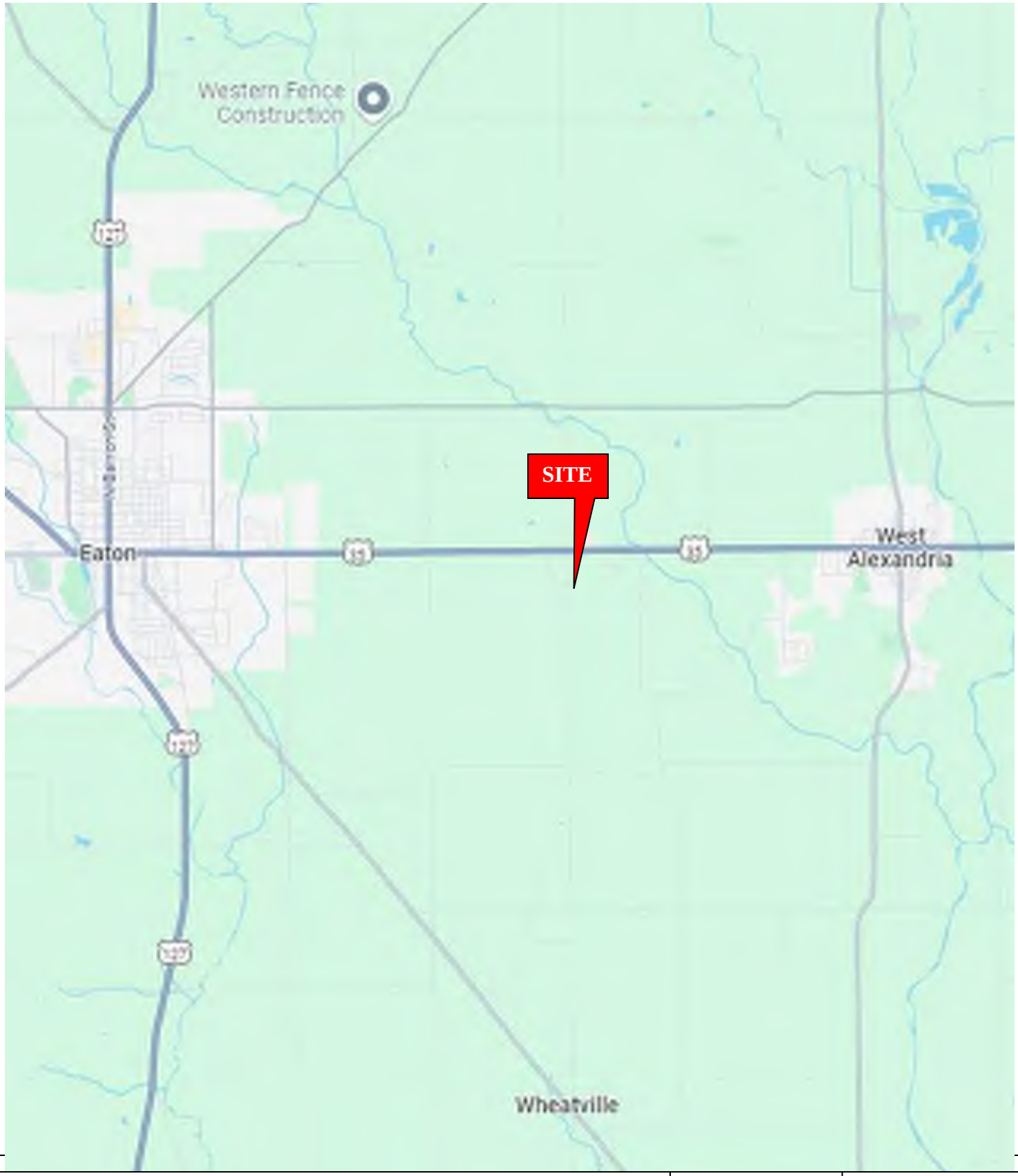


FIGURE 1 - REGIONAL LOCATION MAP

ODOT Preble County Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

N

Rii Project
B-24-018

ODOT Preble County Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

FIGURE 2
AERIAL LOCATION MAP

Rii Project
B-24-018

September 2024

FIGURE 3 - RECOGNIZED ENVIRONMENTAL CONCERNS

ODOT Preble Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

N

Rii Project
B-24-018

APPENDIX B

SITE PHOTOGRAPHS

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
1	8/12/2024

Description:

The Office Building/Garage structure on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
2	8/12/2024

Description:

The Salt Building (Dome) structure on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
3	8/12/2024

Description:

The Sand/Salt Building on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
4	8/12/2024

Description:

The Mobile Trailer structure on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
5	8/12/2024

Description:

The Pole Barn structure on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
6	8/12/2024

Description:

The Small Pump structure on the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
7	8/19/2024

Description:

Location of the oil/water separator with a 2,000-gallon wastewater holding tank located in the garage of the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
8	8/19/2024

Description:

Location of the 5,000-gallon wastewater holding tank located east of the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
9	8/12/2024

Description:

The 6,000-gallon aboveground storage tank (AST), storing gasoline fuel and diesel fuel. The AST is a double-walled insulated tank.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
10	8/12/2024

Description:

The 240-gallon AST located in the Office Building/Garage. The AST is a double-walled insulated tank used to store used oil.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
11	8/12/2024

Description:

The four (4) large plastic ASTs, used to store brine and beet concentrate used for deicing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
12	8/12/2024

Description:

The Rumpke closed box dumpster utilized for tire disposal within the subject property.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
13	8/12/2024

Description:

Commercial truck batteries located in the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
14	8/12/2024

Description:

Observed storage of pesticide products in the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
15	8/12/2024

Description:

Pole-mounted transformers located north of the Office Building/Garage, a "Non-PCB" sticker was observed.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
16	8/12/2024

Description:

Observed old lubricant tank with the grease rack located in the generator room of the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
17	8/12/2024

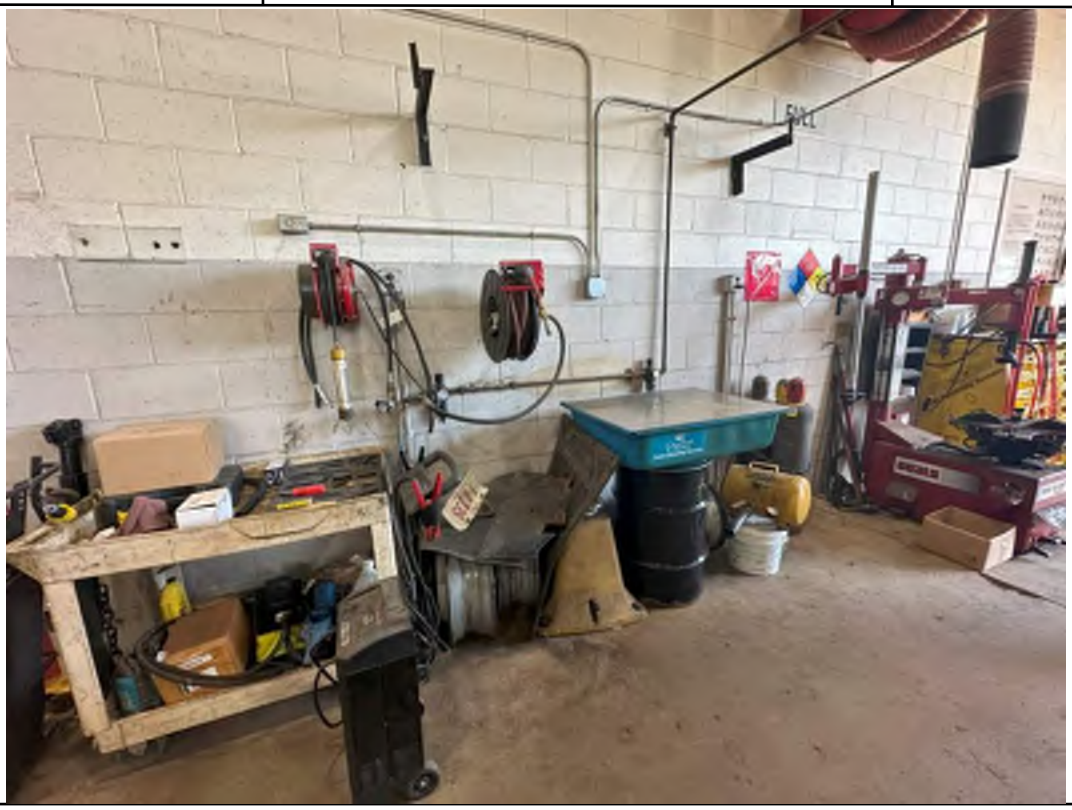
Description:

Stored coolant, chemicals, and petroleum products in the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
18	8/12/2024



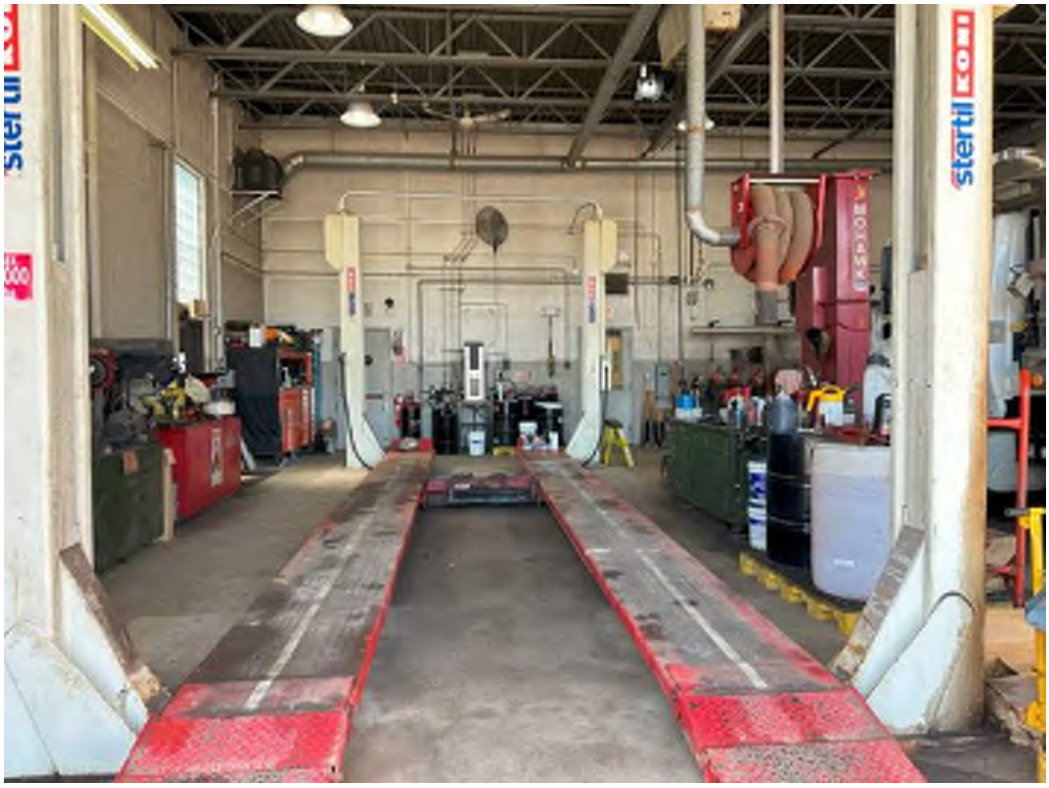
Description:

Parts cleaner observed in the Office Building/Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
19	8/12/2024



Description:

Location of former below ground hydraulic lift in the Office Building/ Garage.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Phase I Environmental Site Assessment	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
20	8/12/2024

Description:

Suspect mercury-containing thermostat in the Office Building/ Garage.

APPENDIX D

SITE SETTING REFERENCES

Summary

Parcel ID	H25530510000017000
Map Number	H25-05-100
Property Address	234 QUAKER TRACE RD
Brief Tax Description	W PT NW (Note: *The Description above is not to be used on legal documents.)
Acres	18.84
Class	E
Land Use	610 EXEMPT PROPERTY OWNED BY STATE OF OHIO
Market Area	H25E1 LANIER TWP TWIN VALLEY EXEMPT
City	UNINCORPORATED
Township	LANIER TOWNSHIP
School District	TWIN VALLEY SD

Owners

Owner	Mailing Address
OHIO STAT	O.D.O.T. 505 S ST RT 741 LEBANON OH 45036

Topography/Utilities

Level Topography	YES	**Standard Roads**	NO
High Topography	NO	**Public Water Utilities**	NO
Low Topography	NO	**Public Sewer Utilities**	NO
Rolling Topography	NO	**Public Gas Utilities**	YES
Standard Topography	NO	**Public Electric Utilities**	YES
Paved Roads	YES	**Private Water Utilities**	YES
Gravel Roads	NO	**Private Sewer Utilities**	YES
Dirt Roads	NO	**Private Gas Utilities**	NO
Sidewalks	NO	**Private Electric Utilities**	NO
Curbs	NO	**Standard Utilities**	NO

Land

Land Type	Code	Frontage	Depth (F/R)	Street Price	Depth Percent	Rate	Adjusted Rate	Adjustment	Total	Value	Acres
IC - INDUSTRIAL/COMMERCIAL	1 - PRIMARY	0	0/0	100	0%	$23,100.00	$23,100.00	0	$161,700.00	$161,700.00	7
IC - INDUSTRIAL/COMMERCIAL	2 - SECONDARY	0	0/0	100	0%	$11,600.00	$11,600.00	0	$137,340.00	$137,340.00	11.84

Commercial

Card	1	**Grade**	A
Business Name	O.D.O.T. GARAGE	**Condition**	A
Description	COMM GAR	**HVAC**	STANDARD
Construction	MASONRY BEARING WALLS	**Exterior Wall**	CONCRETE BLOCK
Number Of Floors	1	**Framing**	CB/MASON
Price Code	455.000	**Roofing**	SHED/FLAT METAL DECK BUILT UP
Height	16	**Window**	CASEMENT
Length	0	**Foundation**	SLAB
Width	0	**Canopy**	
Area	12,681	**Doors**	STEEL INS
Year Built	1972	**Plumbing**	EXTRA FIXTURES: 6
Value	$313,220		

Commercial Detail

Card 1

Description	Construction	Length	Width	Height	Area	Year Built	Year Remodelled	Condition	Grade	Income	Market Value
AREA OFFICE (PER FLOOR)	C	63	47	12	2,961	1972	0	A	Average	0	$107,780

Yard Items

Description	Construction	Length	Width	Height	Area	Year Built	Year Remodelled	Condition	Grade	Income	Market Value
A IMPL SHED	S	40	79	16	3160	1972	0	F	F	0	$8,850
A ODOT SAND/ SALT BUILDING	S	46	48	14	2208	1972	0	F	A	0	$33,380
A ODOT SAND/ SALT BUILDING	D	0	0	0	8020	1980	0	A	A	0	$134,740
A OFFICE: 1-2 STORY-WALKUP (PER FLOOR)		12	55	0	660	2011	0		B	0	$24,830
A PATIO: CONCRETE		15	22	0	330	2009	0	A	N	0	$0
A PAVING: ASPHALT		0	0	0	119555	1972	0	A	N	0	$0
A SHED		10	12	0	120	2011	0	A	N	0	$0
U FENCE: BARBED WIRE, 3 STRANDS		0	0	0	0	1972	0	A	N	0	$0

Sales

Sale Date	Sale Amount	Buyer	Conveyance Number	Deed Type
1/1/1900	$0	OHIO STATE	0	

Recent Sales In Area

Sale date range:

From: 08/26/2021 To: 08/26/2024

Sales by Neighborhood

1500 Feet Sales by Distance

Tentative/Current Valuation

Assessed Year	2023	2022
Land Value	$299,040	$284,240
CAUV Value	$0	$0
Improvements Value	$622,800	$527,400
Total Value (Appraised 100%)	**$921,840**	**$811,640**
Land Value	$104,660	$99,480
CAUV Value	$0	$0
Improvements Value	$217,980	$184,590
Total Value (Assessed 35%)	**$322,640**	**$284,070**

Valuation History

Date	Tax Year	Reason	Taxable Appraised Land Value	Appraised Improvements Value	Appraised Total Value	Taxable Assessed Land Value	Assessed Improvements Value	Assessed Total Value
8/24/2023	2023	Reappraisal	$299,040	$622,800	$921,840	$104,660	$217,980	$322,640
10/5/2020	2020	Reappraisal - Triennial Update - Revert ICE Depreciation	$284,240	$527,400	$811,640	$99,480	$184,590	$284,070
6/24/2017	2017	Reappraisal	$284,240	$527,400	$811,640	$99,480	$184,590	$284,070
11/15/2014	2014	Reappraisal - Triennial Update - TRI	$141,380	$518,400	$659,780	$49,480	$181,440	$230,920
8/1/2011	2011	Reappraisal - REVAL 2011	$141,380	$518,400	$659,780	$49,480	$181,440	$230,920
11/13/2008	2008	Reappraisal - Triennial Update - 2008	$141,380	$383,900	$525,280	$49,480	$134,370	$183,850
11/17/2005	2005	Reappraisal - REVAL	$141,380	$383,900	$525,280	$49,480	$134,370	$183,850
12/31/2004	2004	2004	$134,600	$351,800	$486,400	$47,110	$123,130	$170,240

Taxes are calculated based on valuations effective as of tax lien date of January 1, 2022. First half of taxes are due the 3rd Friday in February of each year and Second half tax bills are due the 3rd Friday of July each year. For questions regarding taxes please contact the Preble County Treasurer's office at (937) 456-8140. I would like to encourage that payments be made using the following choices:

Mail in your check along with the bottom stub on the tax bill. You may pay by credit card through the Auditor's web site (directions will appear on the top right of the tax bill). This transaction takes 5 to 7 business days to complete so you must plan ahead.

You may also have the tax payment set up through your bank checking account. (online billpay)

We also have a drop box inside the courthouse at the security desk that is available.

You may also pay at the local banks and branches during their business hours. You cannot pay at US Bank or Fifth Third Bank at this time.

Tax Distribution

Estimated Tax Distribution

Pay Taxes

Pay taxes online

Tax History

Tax Year (click for detail)	1st Half	Full Year
⊞ 2023 Payable 2024	$0.00	$0.00
⊞ 2022 Payable 2023	$0.00	$0.00
⊞ 2021 Payable 2022	$0.00	$0.00
⊞ 2020 Payable 2021	$0.00	$0.00
⊞ 2019 Payable 2020	$0.00	$0.00
⊞ 2018 Payable 2019	$0.00	$0.00
⊞ 2017 Payable 2018	$0.00	$0.00
⊞ 2016 Payable 2017	$0.00	$0.00
⊞ 2015 Payable 2016	$0.00	$0.00
⊞ 2014 Payable 2015	$0.00	$0.00
⊞ 2013 Payable 2014	$0.00	$0.00
⊞ 2012 Payable 2013	$0.00	$0.00
⊞ 2011 Payable 2012	$0.00	$0.00
⊞ 2010 Payable 2011	$0.00	$0.00
⊞ 2009 Payable 2010	$0.00	$0.00
⊞ 2008 Payable 2009	$0.00	$0.00
⊞ 2007 Payable 2008	$0.00	$0.00

Special Assessments

Tax Year	Project Name	1st Half Due	1st Half Collected	1st Half Balance	2nd Half Due	2nd Half Collected	2nd Half Balance
2023 Payable 2024	17-911-00-911 SYSTEM	$2.50	($2.50)	$0.00	$2.50	($2.50)	$0.00
2022 Payable 2023	17-911-00-911 SYSTEM	$2.50	($2.50)	$0.00	$2.50	($2.50)	$0.00
2021 Payable 2022	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2011 Payable 2012	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2010 Payable 2011	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2009 Payable 2010	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2009 Payable 2010	33-002-00-LANDFILL	$388.76	$0.00	$388.76	$388.76	$0.00	$388.76
2008 Payable 2009	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2008 Payable 2009	33-002-00-LANDFILL	$388.76	$0.00	$388.76	$388.76	$0.00	$388.76
2007 Payable 2008	17-911-00-911 SYSTEM	$2.50	$0.00	$2.50	$2.50	$0.00	$2.50
2007 Payable 2008	33-002-00-LANDFILL	$388.76	$0.00	$388.76	$388.76	$0.00	$388.76

Tax Payments

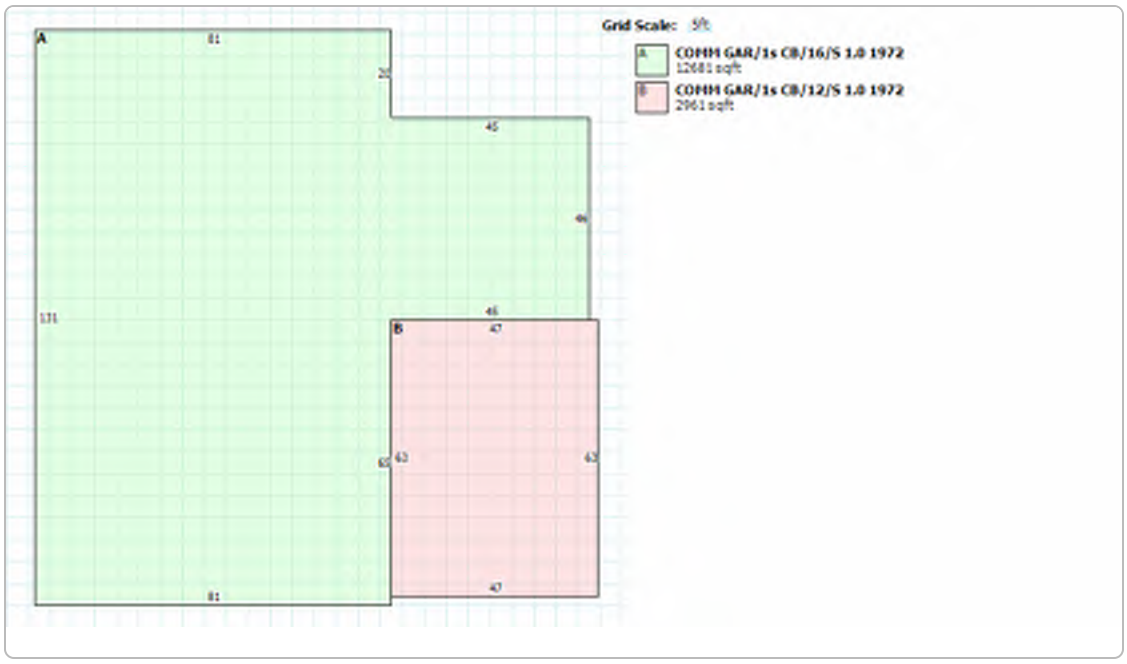
Detail:

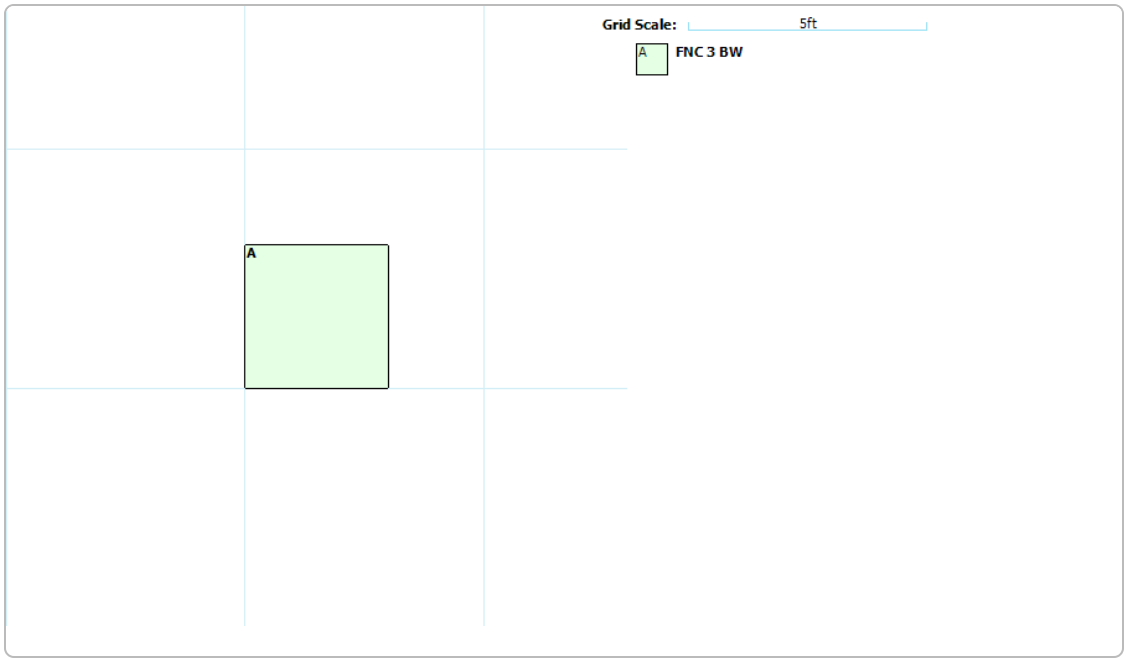
Tax Year	Payment Date	Receipt Number	Amount Paid
2023 Payable 2024	1/25/2024	867536	$5.00
2022 Payable 2023	1/31/2023	824354	$10.84

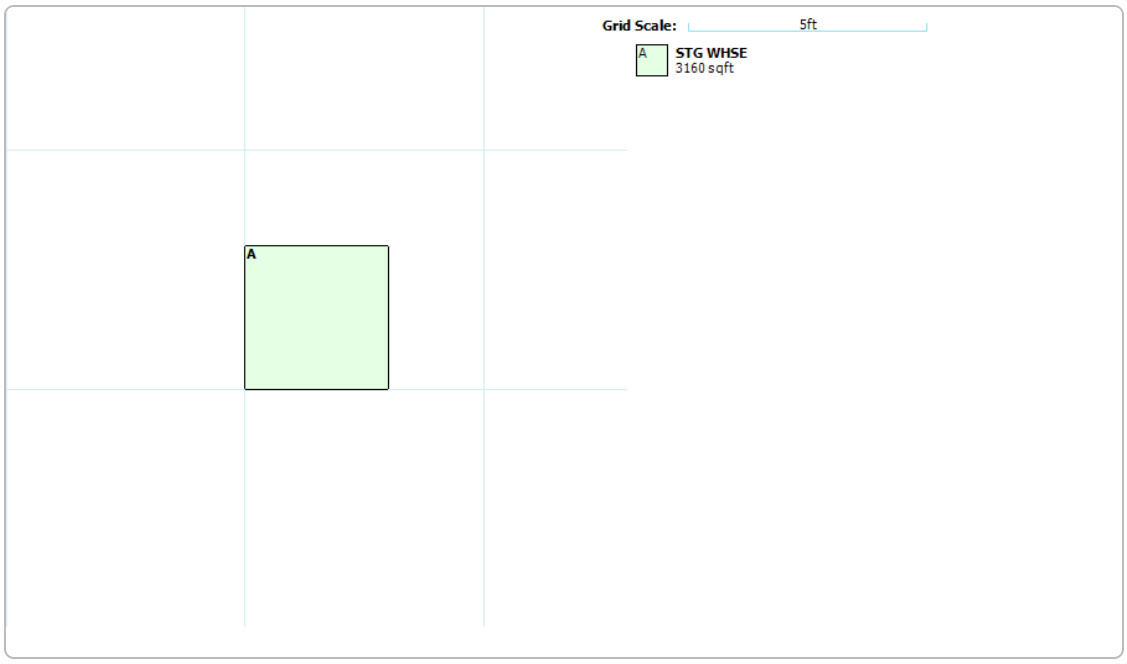
Total:

Tax Year	Amount Paid
2023 Payable 2024	$5.00
2022 Payable 2023	$10.84

Sketches



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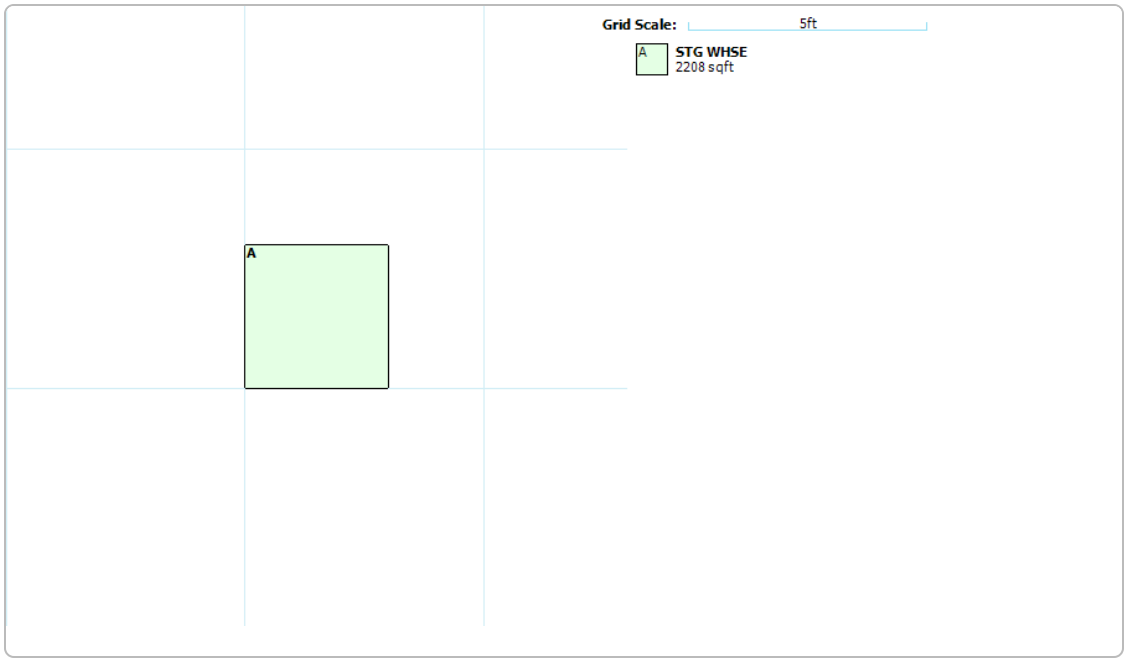
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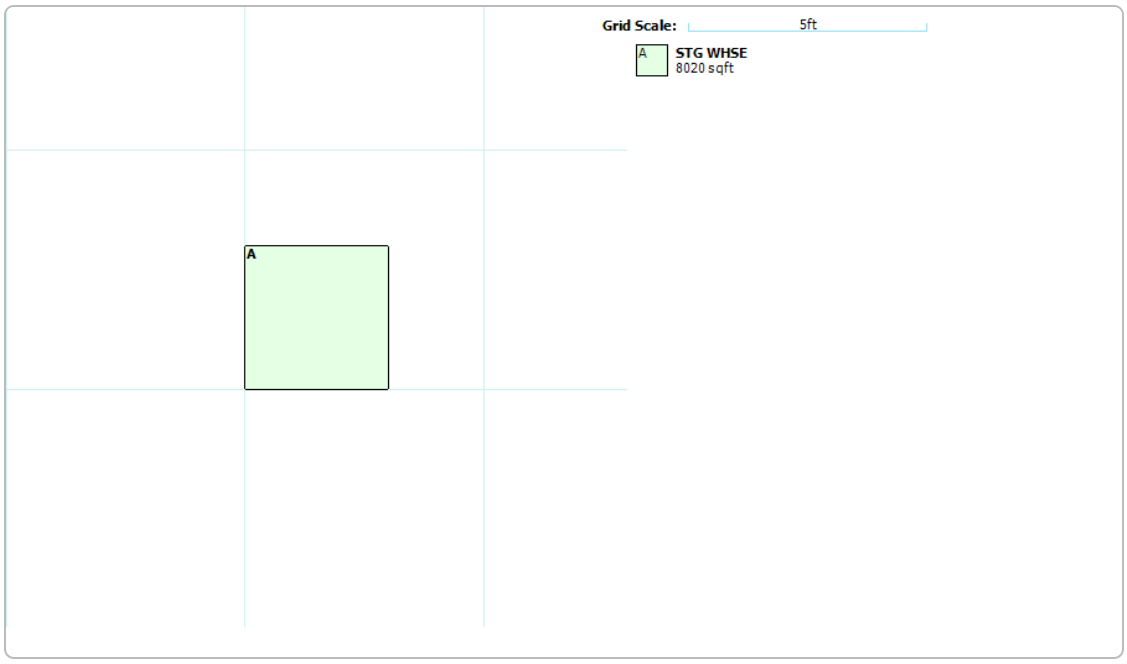
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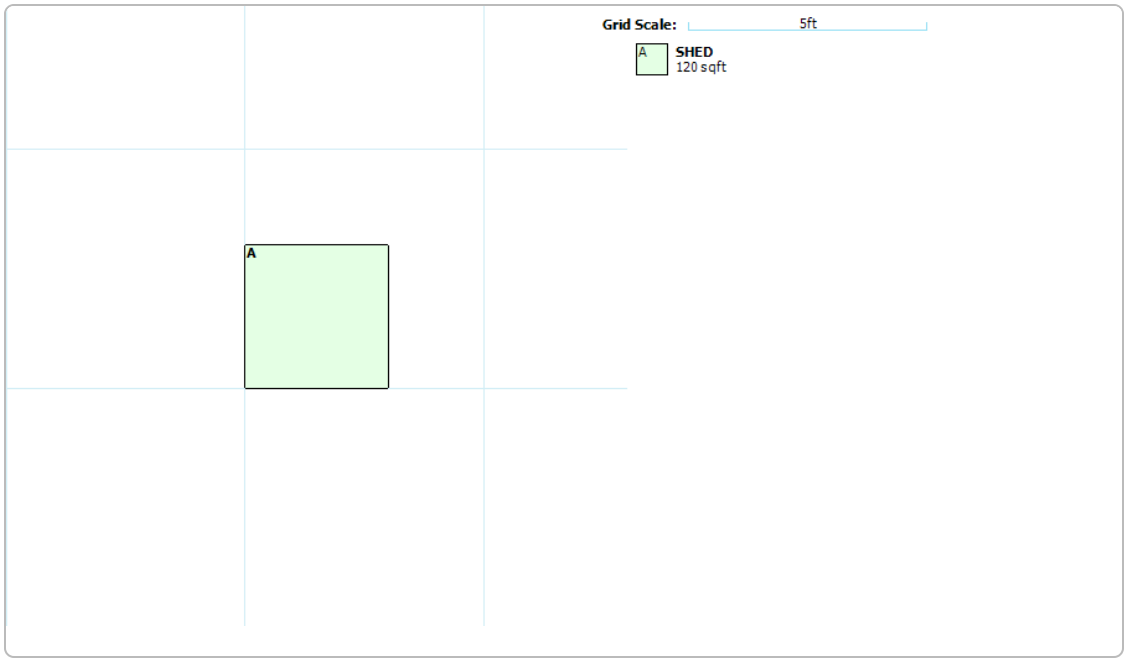
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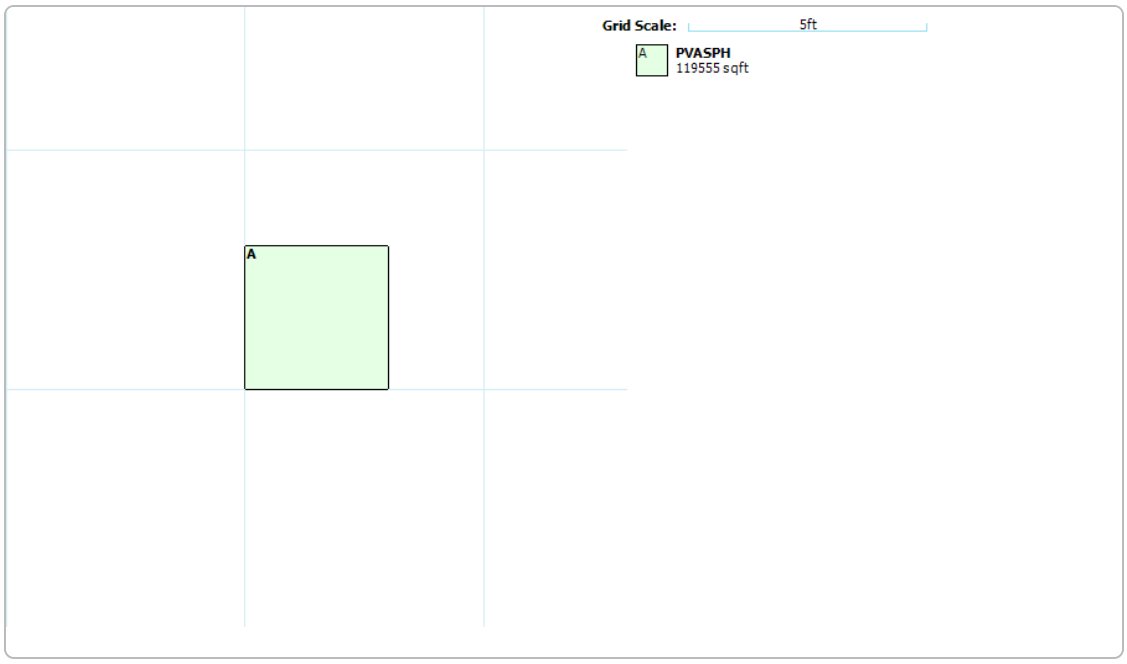
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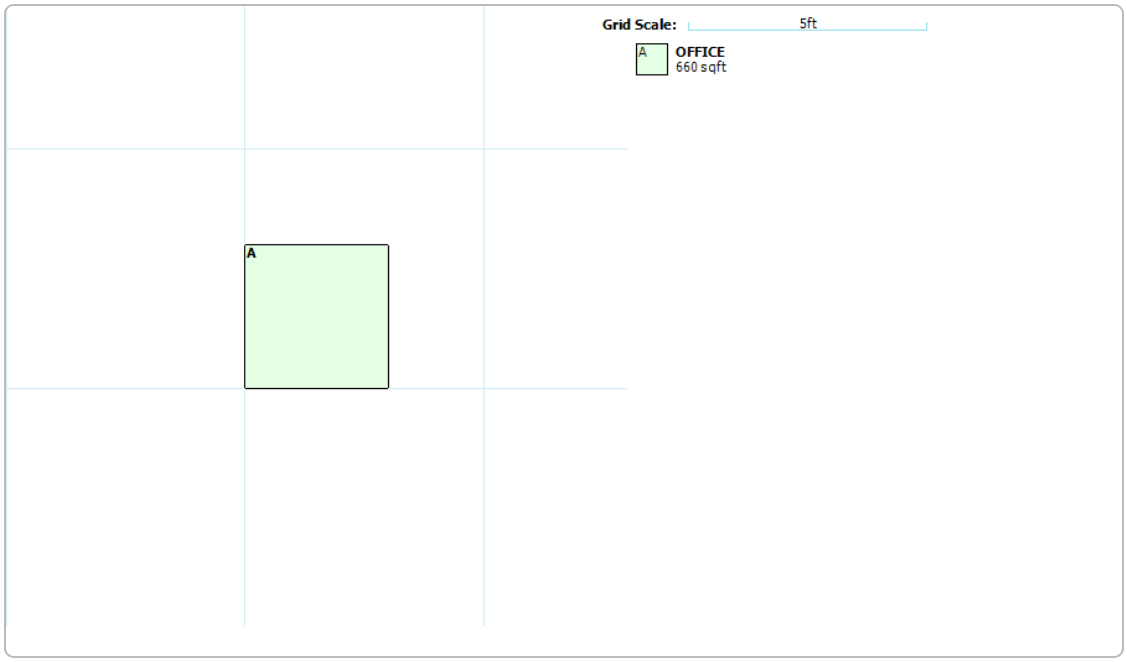
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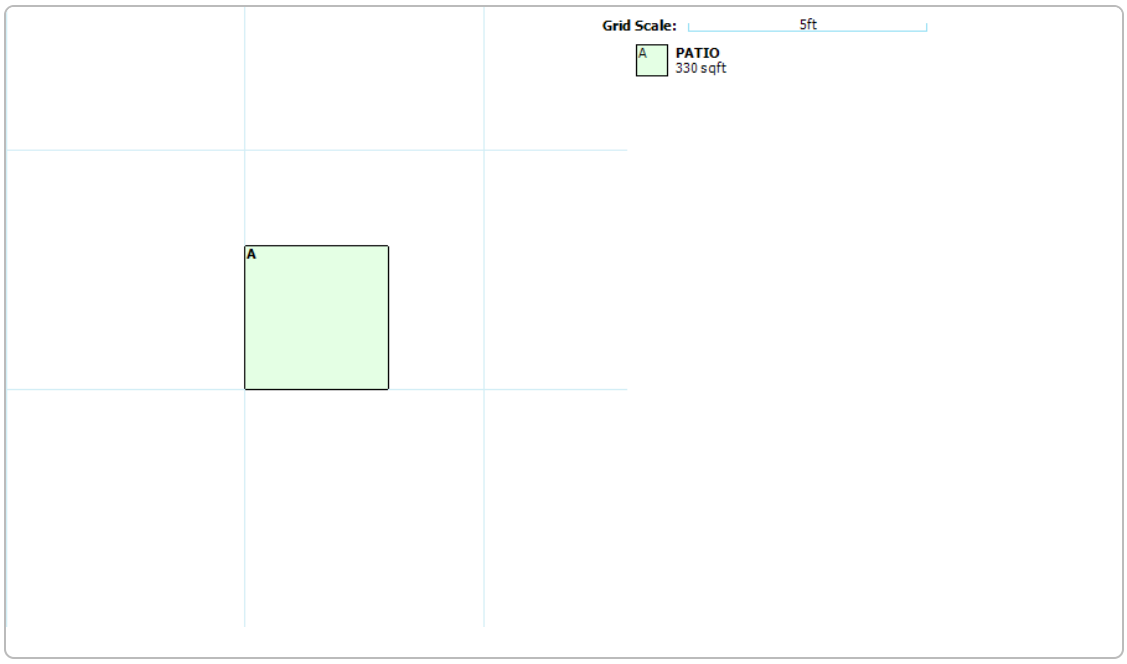


Map

Property Card

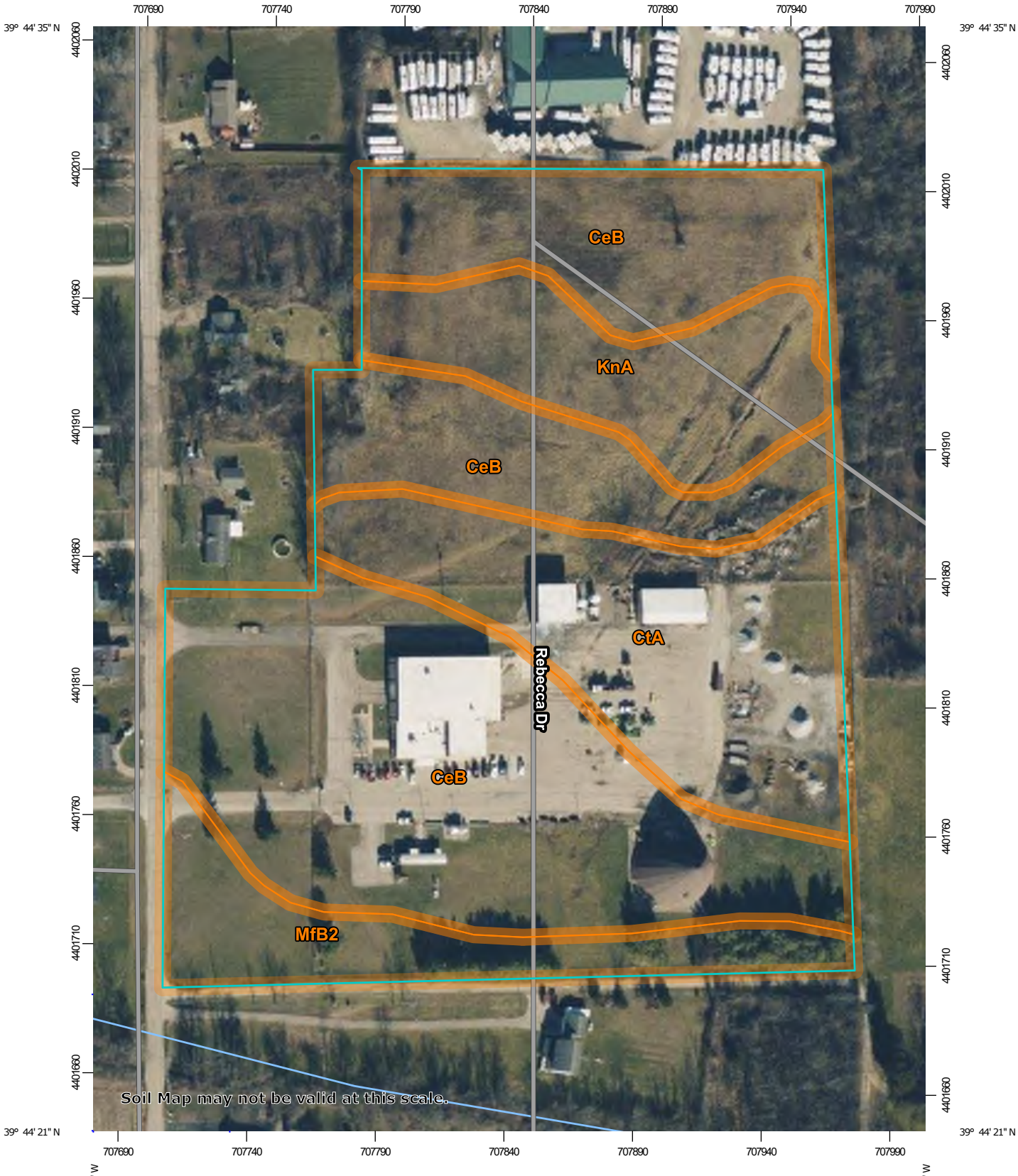
Property Card

No data available for the following modules: Agricultural, Improvements, Residential Buildings.

The information provided by Preble County is provided 'as is' and for reference only. The user expressly agrees that the use of Preble County's web site is at the user's sole risk.
| User Privacy Policy | GDPR Privacy Notice
Last Data Upload: 8/26/2024, 4:03:46 AM

Contact Us

Developed by
Schneider GEOSPATIAL



Map Scale: 1:2,080 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Preble County, Ohio
Survey Area Data: Version 22, Sep 11, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

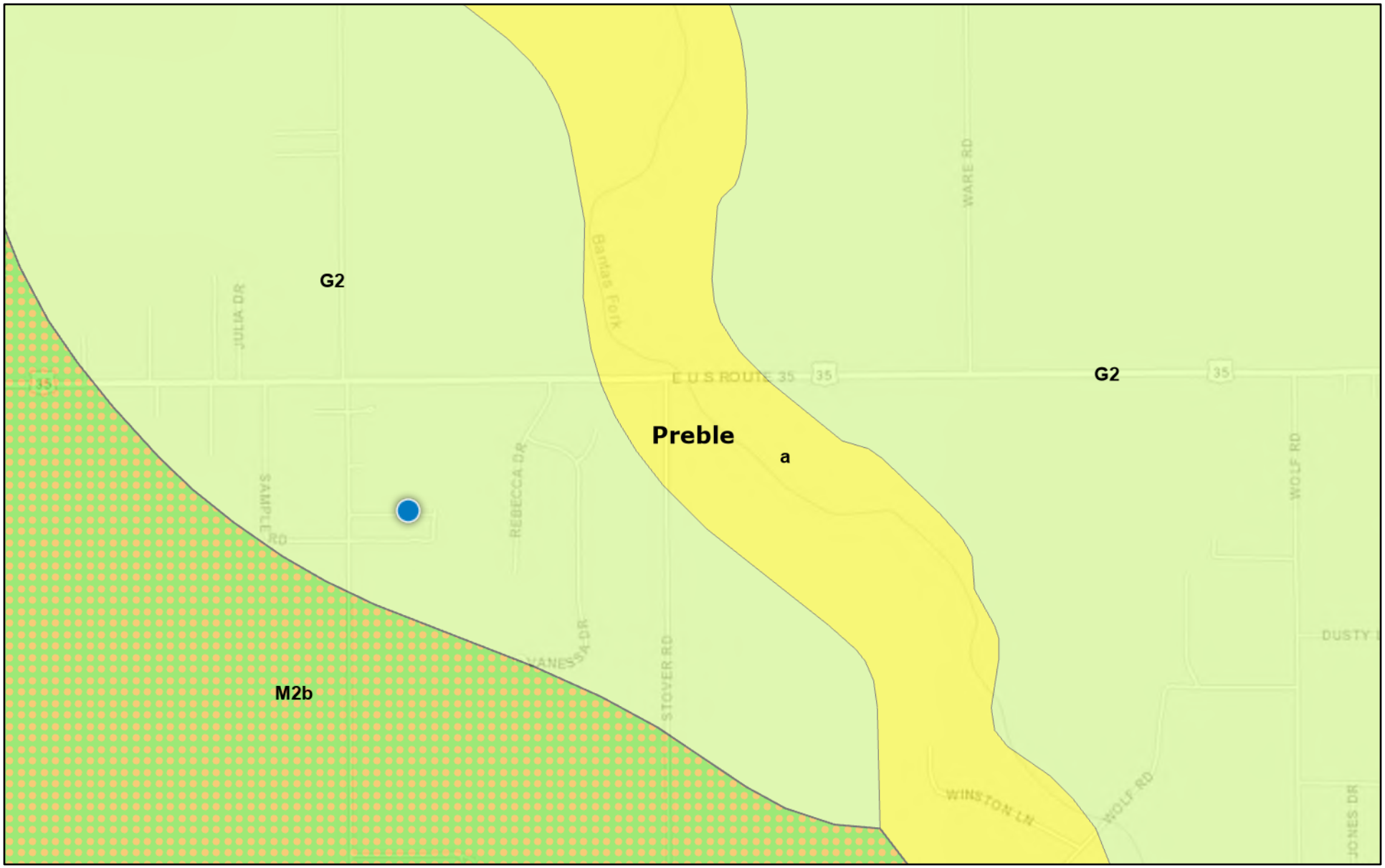
Date(s) aerial images were photographed: Oct 28, 2019—Dec 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeB	Celina silt loam, 2 to 6 percent slopes	10.1	56.8%
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes	3.7	20.8%
KnA	Kokomo silt loam, 0 to 1 percent slopes	2.2	12.3%
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	1.8	10.1%
Totals for Area of Interest		**17.7**	**100.0%**

6XUILFLDO *HROJ\ 0DS



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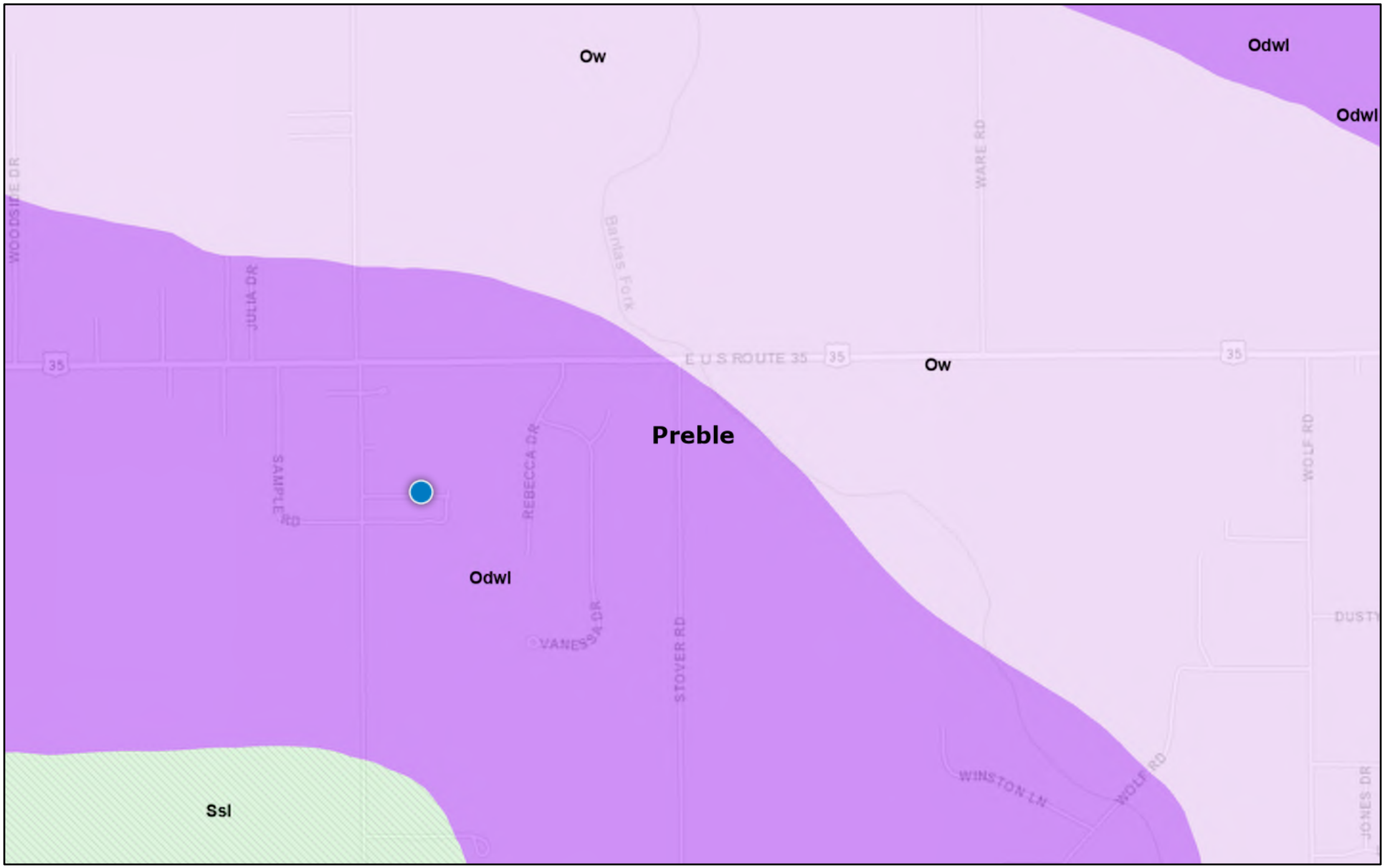

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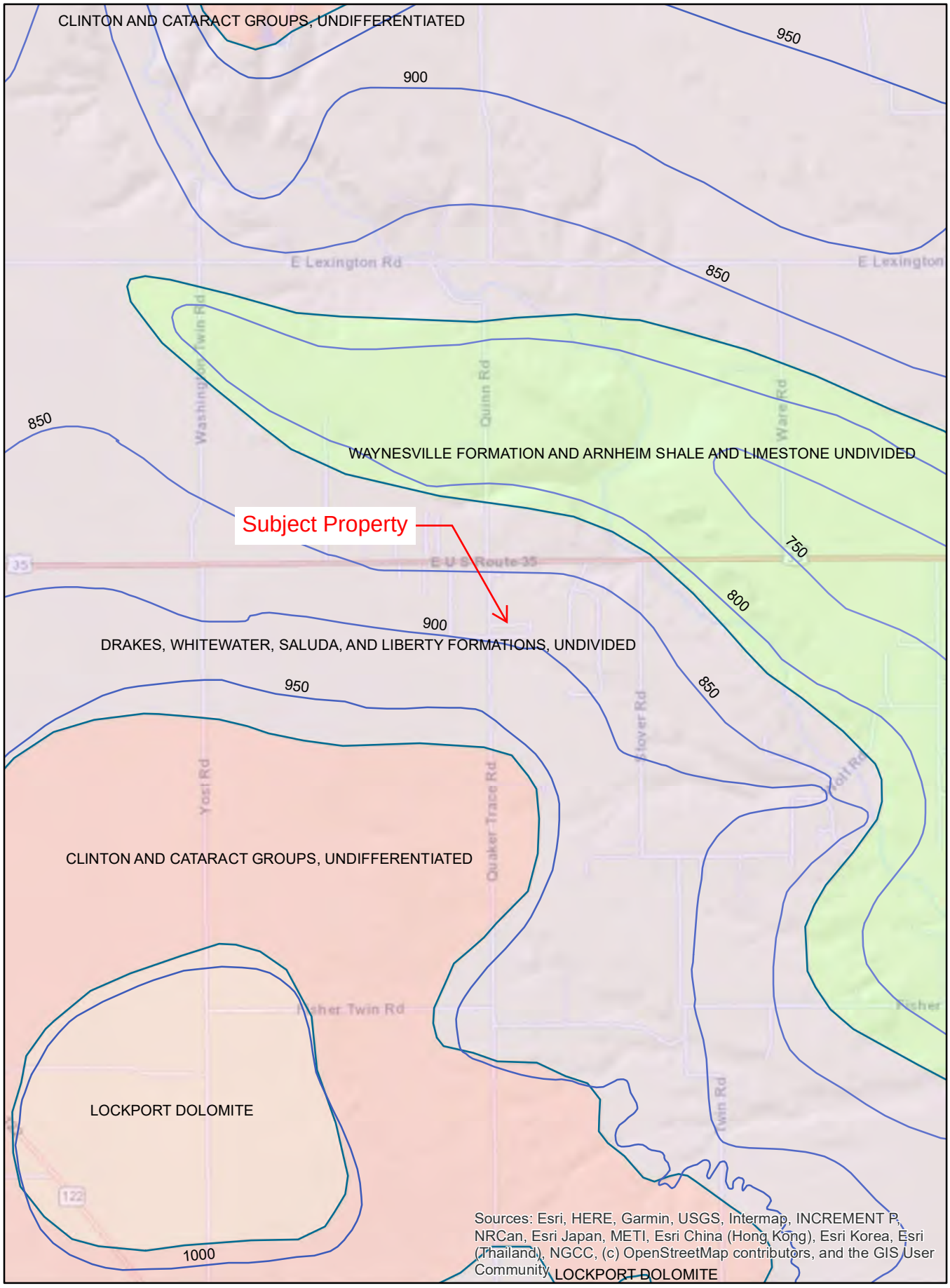
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Subject Property
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DRAKES, WHITEWATER, SALUDA, AND LIBERTY FORMATIONS, UNDIVIDED
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Quaker Trace Rd
Hover Rd
Toll Rd
CLINTON AND CATARACT GROUPS, UNDIFFERENTIATED
Fisher Twin Rd
Fisher
Twin Rd
LOCKPORT DOLOMITE
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Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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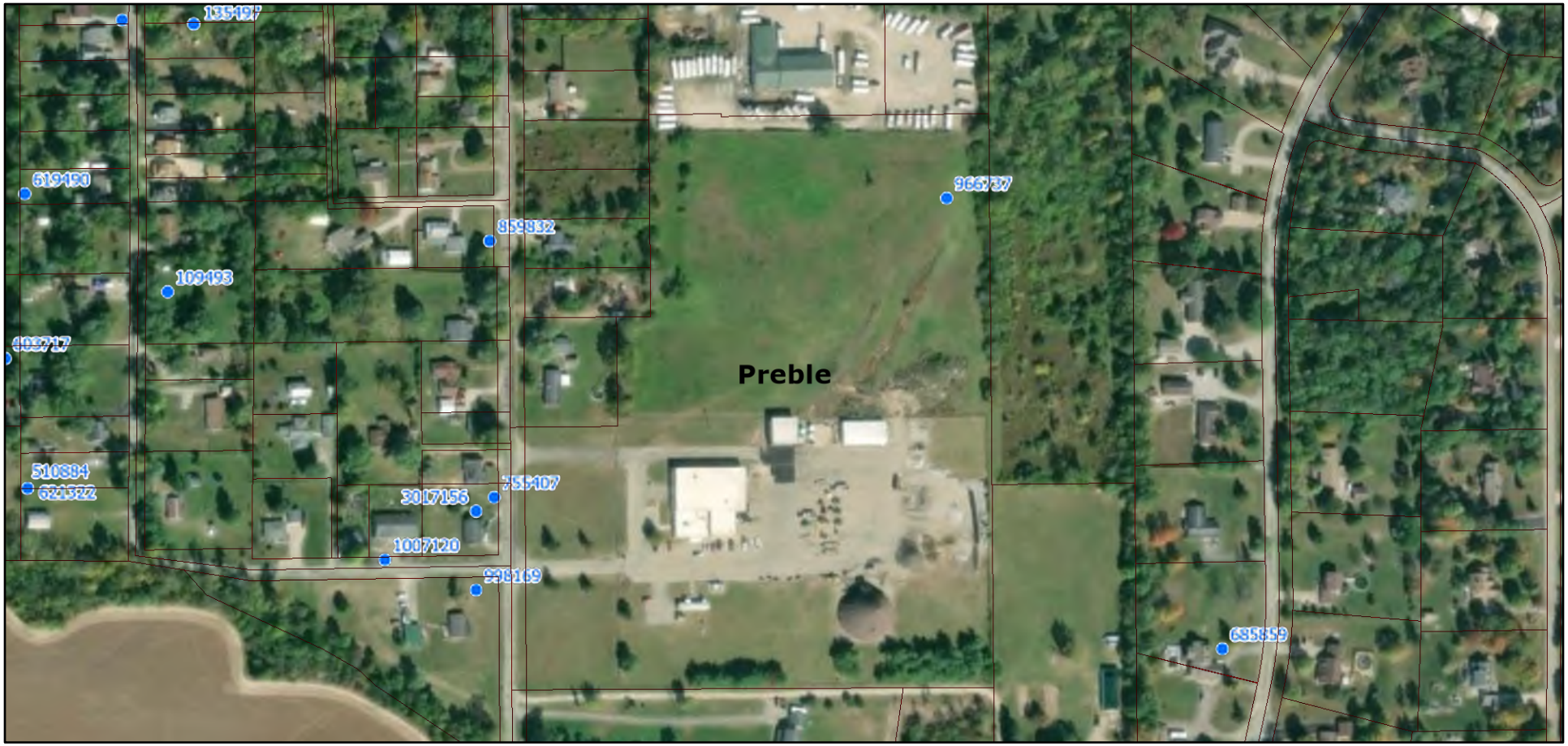

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U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands

September 9, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

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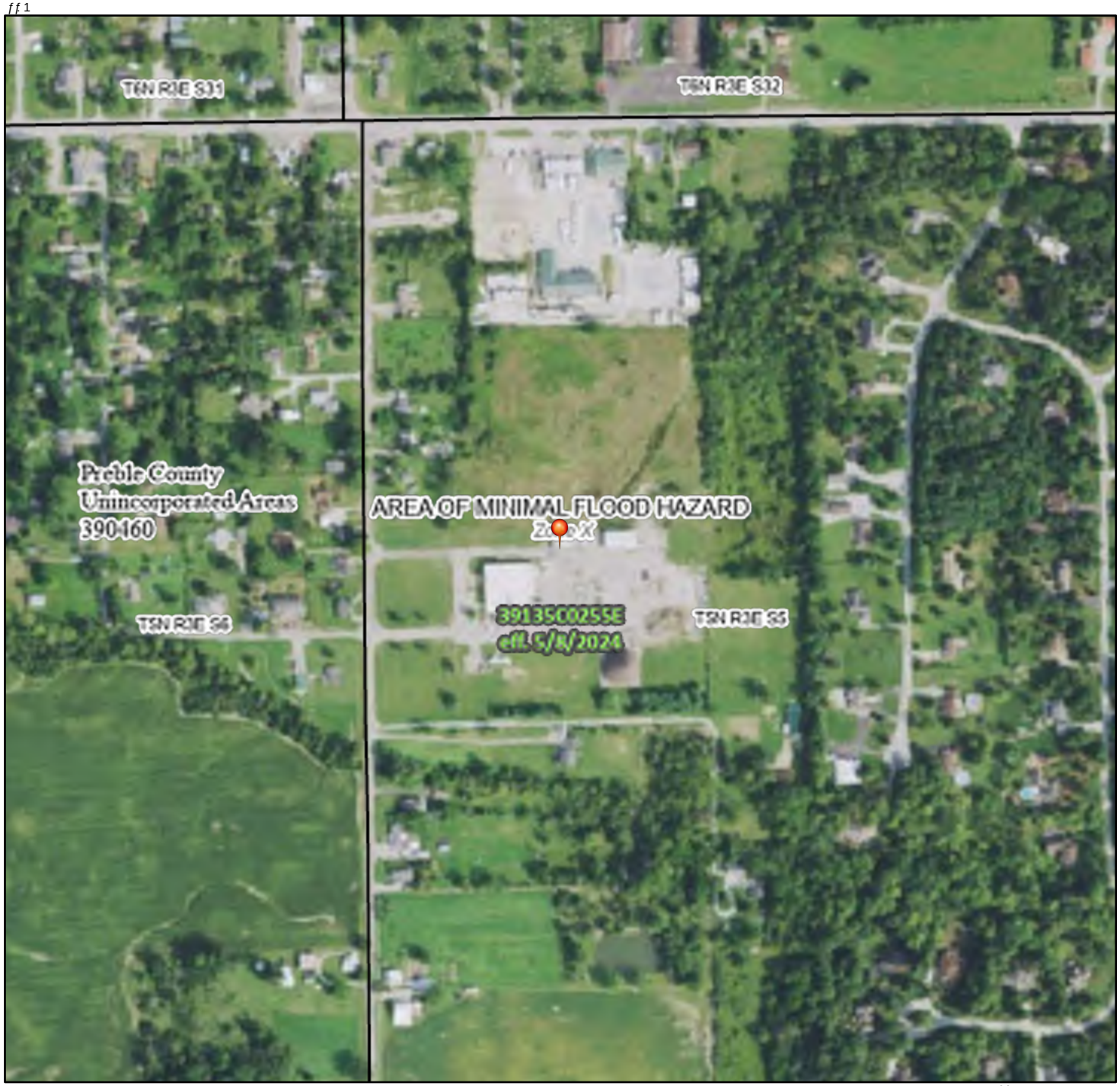

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APPENDIX C

GLOSSARY OF TERMS AND ACRONYMS

ACRONYMS

ACM - Asbestos Containing Material
AHERA - Asbestos Hazard Emergency Response Act
AST - Aboveground Storage Tank
ASTM - American Society for Testing and Materials
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes
BUSTR - Bureau of Underground Storage Tank Regulations
CAA - Clean Air Act
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS - CERCLA Information System
CFR - Code of Federal Regulations
COE - United States Army Corps of Engineers
CORRACTS-TSD facilities subject to Corrective Action under RCRA
CPSC - Consumer Product Safety Commission
CWA - Clean Water Act
DERR - Division of Emergency & Remedial Response Database
DOCKET - Civil Enforcement Docket-Office of Enforcement and Compliance Monitoring
DOT - Department of Transportation
EDDA Environmental Due Diligence Audit
EPA - Environmental Protection Agency
EPCRA - Emergency Planning and Community Right to Know Act
ERNS - Emergency Response Notification System
ESA - Environmental Site Assessment
FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act
FINDS - Facility Index System
FOIA - Freedom of Information Act
FR - Federal Register
FWPCA - Federal Water Pollution Control Act
HSWA - Hazardous and Solid Waste Amendments
HUD - Department of Housing and Urban Development
LBP - Lead-based Paint
LUST - Leaking Underground Storage Tank
MSDS - Material Safety Data Sheet
MSL - Master Sites List of Ohio
NCP - National Contingency Plan
NEPA - National Environmental Policy Act
NESHAP - National Emission Standard for Hazardous Air Pollutants
NFA - No Further Action
NFRAP - No Further Remedial Action Planned (Delisted CERCLA Site)
NLLAP - National Lead Laboratory Accreditation Program
NLR - No Longer Regulated Site
NPDES - National Pollution Discharge Elimination System
NPL - National Priorities List

NRCS - Natural Resources Conservation Service
NVLAP - National Voluntary Laboratory Accreditation Program
NWI - National Wetland Inventory
OAC - Ohio Administrative Code
ODH - Ohio Department of Health
ODNR - Ohio Department of Natural Resources
ODOT - Ohio Department of Transportation
OEPA - Ohio Environmental Protection Agency
ORC - Ohio Revised Code
OSHA - Occupational Safety and Health Administration
OVA - Organic Vapor Analyzer
PADS - Polychlorinated Biphenyl Activity Database System
PAH - Polynuclear Aromatic Hydrocarbons
PCB - Polychlorinated Biphenyl
pCi/L - Picocuries per Liter
PID - Photoionization Detector
PLM - Polarized Light Microscopy
PPB - Parts Per Billion
PPM - Parts Per Million
PRP - Potentially Responsible Party
REC - Recognized Environmental Condition
RCRA - Resource Conservation and Recovery Act
RCRIS - Resource Conservation and Recovery Information System
Rii - Resource International, Incorporated
SARA - Superfund Amendments and Reauthorization Act of 1986
SCS - Soil Conservation Service
SFM - State Fire Marshal
SSTS - Section Seven Tracking System
SVOC - Semi-Volatile Organic Compounds
SWCD - Soil and Water Conservation District
SWDA - Solid Waste Disposal Act
SWF - Solid Waste Facility
TPH - Total Petroleum Hydrocarbons
TRI - Toxic Release Inventory
TSCA - Toxic Substances Control Act
TSD - Treatment, Storage, or Disposal Facility
USC - United States Code
USDA - United States Department of Agriculture
USGS - United States Geological Survey
UST - Underground Storage Tank
VAP - Voluntary Action Program
VCP Voluntary Action Program Site
VOC - Volatile Organic Compounds
WTP - Water Treatment Plant
WWTP - Wastewater Treatment Plant

DEFINITION OF TERMS

Actual Knowledge - the knowledge actually possessed by an individual who is a real person, rather than an entity. Actual knowledge is to be distinguished from constructive knowledge that is knowledge imputed to an individual or entity.

Adjoining Properties - any real property or properties the border of which is contiguous or partially contiguous with that of the property, or that would be contiguous or partially contiguous with that of the property but for a street, road, or other public thoroughfare separating them.

Appropriate Inquiry - that inquiry constituting "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in CERCLA, 42 USC 9601(35)(B), that will give a party to a commercial real estate transaction the innocent landowner defense to CERCLA liability (42 USC 9601(A) and (B) and 9607(b)(3)), assuming compliance with other elements of the defense.

Asbestos Containing Material (ACM) - any material or product that contains more than 1% asbestos.

City (or County) Directories - directories published by private (or sometimes government) sources that show ownership, occupancy, and/or use of sites by reference to street addresses.

Commercial Real Estate - any real property except a dwelling or property with no more than four dwelling units exclusively for residential use (except that a dwelling or property with no more than four dwelling units exclusively for residential use is included in this term when it has a commercial function, as in the building of such dwellings for profit). This term includes but is not limited to undeveloped real property and real property for industrial, retail, office, agricultural, other commercial, medical, or educational purposes; property used for residential purposes that has more than four residential dwelling units; and property with no more than four dwelling units for residential use when it has a commercial function, as in the building of such dwellings for profit.

Construction Debris - concrete, brick, asphalt, and other such building materials discarded in the construction of a building or other improvement to property.

Contaminated Public Wells - public wells used for drinking water that have been designated by a government entity as contaminated by toxic substances, or as having water unsafe to drink without treatment.

Demolition Debris - concrete, brick, asphalt, and other such building materials discarded in the demolition of a building or other improvement to property.

DEFINITION OF TERMS (cont'd)

Drum - a container (typically, but not necessarily, holding 55 gallons of liquid) that may be used to store hazardous substances or petroleum products.

Dry Wells - underground areas where soil has been removed and replaced with pea gravel, coarse sand, or large rocks. Dry wells are used for drainage, to control storm runoff, for the collection of spilled liquids (intentional or unintentional) and wastewater disposal (often illegal).

Due Diligence - the process of inquiring into the environmental characteristics of a parcel of commercial real estate or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes.

Dwelling - structure or portion thereof used for residential habitation.

Environmental Audit - the investigative process to determine if the operations of an existing facility are in compliance with applicable environmental laws and regulations.

Environmental Lien - a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including (but not limited to) liens imposed pursuant to CERCLA 42 USC 9607(1) and similar state or local laws.

Environmental Professional - a person possessing sufficient training and experience necessary to conduct a site reconnaissance, interviews, and other activities in accordance with ASTM E 1527, and from the information generated by such activities, having the ability to develop opinions and conclusions regarding recognized environmental conditions in connection with the property in question. An individual's status as an environmental professional may be limited to the type of assessment to be performed or to specific segments of the assessment for which the professional is responsible. The person may be an independent contractor or an employee of the user.

Environmental Site Assessment (ESA) - the process by which a person or entity seeks to determine if a particular parcel of real property (including improvements) is subject to recognized environmental conditions. At the option of the user, an environmental site assessment may include more inquiry than that constituting appropriate inquiry or, if the user is not concerned about qualifying for the innocent landowner defense, less inquiry than that constituting appropriate inquiry.

DEFINITION OF TERMS (cont'd)

Federal Register (FR) - publication of the United States government published daily (except for federal holidays and weekends) containing all proposed and final regulations and some other activities of the federal government. When regulations become final, they are included in the Code of Federal Regulations (CFR), as well as published in the Federal Register.

Fill Dirt - dirt, soil, sand, or other earth, that is obtained off-site, that is used to fill holes or depressions, create mounds, or otherwise artificially change the grade or elevation of real property. It does not include material that is used in limited quantities for normal landscaping activities.

Fire Insurance Maps - maps produced for private fire insurance map companies that indicate uses of properties at specified dates and that encompass the property. These maps are often available at local libraries, historical societies, private resellers, or from the map companies who produced them.

Hazard - A circumstance or condition that can cause harm. Hazards are often categorized into four groups: biological, chemical, physical, and radiation.

Hazardous Substance - a substance defined as a hazardous substance pursuant to CERCLA 42 USC part 9601(14), as interpreted by EPA regulations and the courts: "(A) any substance designated pursuant to section 1321(b)(2)(A) of Title 33, (B) any element, compound, mixture, solution, or substance designated pursuant to 42 USC part 9602, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 USC part 6921), (D) any toxic pollutant listed under section 1317(a) of Title 33, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act (42 USC part 7412), and (F) any imminently hazardous chemical substance or mixture with respect to which the EPA Administrator has taken action pursuant to section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under the items listed above. The term also does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and synthetic gas).

Hazardous Waste - any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 USC 6921)(but not including any waste the regulation of which under the Solid Waste Disposal Act (42 USC 6901 et seq.) has been suspended by Act of Congress).

Incident - The release or potential release of a hazardous substance into the environment.

DEFINITION OF TERMS (cont'd)

Innocent Landowner Defense - that defense to CERCLA liability provided in 42 USC 9601(35) and 9607(b)(3). One of the requirements to qualify for this defense is that the party make "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice." There are additional requirements to qualify for this defense.

Key Site Manager - the person identified by the owner of a property as having good knowledge of the uses and physical characteristics of the property.

Landfill - a place, location, tract of land, area, or premises used for the disposal of solid wastes as defined by state solid waste regulations. The term is synonymous with the term solid waste disposal site and is also known as a garbage dump, trash dump, or similar term.

Material Safety Data Sheet (MSDS) - written or printed material concerning a hazardous substance which is prepared by chemical manufacturers, importers, and employers for hazardous chemicals pursuant to OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

National Contingency Plan (NCP) - the National Oil and Hazardous Substances Pollution Contingency Plan, found at 40 CFR 300, that is the EPA's blueprint on how hazardous substances are to be cleaned up pursuant to CERCLA.

Obvious - that which is plain or evident; a condition or fact that could not be ignored or overlooked by a reasonable observer while visually or physically observing the property.

Occupants - those tenants, subtenants, or other persons or entities using the property or a portion of the property.

Owner - generally the fee owner of record of the property.

Petroleum Exclusion - The exclusion from CERCLA liability provided in 42 USC 9601(14), as interpreted by the courts and EPA: "The term (hazardous substance) does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas)."

DEFINITION OF TERMS (cont'd)

Petroleum Products - Those substances included within the meaning of the petroleum exclusion to CERCLA, 42 USC 9601(14), as interpreted by the courts and EPA, that is: petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under Subparagraphs (A) through (F) of 42 USC 9601(14), natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). (The word fraction refers to certain distillates or crude oil, including gasoline, kerosene, diesel oil, jet fuels, and fuel oil, pursuant to Standard Definitions of Petroleum Statistics (American Petroleum Institute, Fourth Edition, 1988).

Pits, Ponds, or Lagoons - man-made or natural depressions in a ground surface that are likely to hold liquids or sludge containing hazardous substances or petroleum products. The likelihood of such liquids or sludge being present is determined by evidence of factors associated with the pit, pond, or lagoon, including, but not limited to, discolored water, distressed vegetation, or the presence of an obvious wastewater discharge.

Practically Reviewable - information that is practically reviewable means that the information is provided by the source in a manner and in a form that, upon examination, yields information relevant to the property without the need for extraordinary analysis of irrelevant data. The form of the information is such that the user can review the records for a limited geographic area. Records that cannot be feasibly retrieved by reference to the location of the property or a geographic area in which the property is located are not generally practically reviewable. Most databases of public records are practically reviewable if they can be obtained from the source agency by the county, city, zip code, or other geographic area of the facilities listed in the record system. Records that are sorted, filed, organized, or maintained by the source agency only chronologically are not generally practically reviewable. Listings in publicly available records which do not have adequate address information to be located geographically are not generally considered practically reviewable.

Property - the real property that is the subject of the Phase I ESA. Real property includes buildings and other fixtures and improvements located on the property and affixed to the land.

Publicly Available - information that is publicly available means that the source of the information allows access to the information by anyone upon request.

Reasonably Ascertainable - information that is (1) publicly available, (2) obtainable from its source within reasonable time and cost.

DEFINITION OF TERMS (cont'd)

Recognized Environmental Conditions (RECs) - the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

Risk - The probability that an unwanted event will occur.

Solid Waste Disposal Site - a place, location, tract of land, area, or premises used for the disposal of solid wastes as defined by state solid waste regulations. The term is synonymous with the term landfill and is also known as a garbage dump, trash dump, or similar term.

Solvent - a chemical compound that is capable of dissolving another substance and may itself be a hazardous substance, used in a number of manufacturing/industrial processes including but not limited to the manufacture of paints and coatings for industrial and household purposes, equipment clean-up, and surface degreasing in metal fabricating industries.

Sump - a pit, cistern, cesspool, or similar receptacle where liquids drain, collect, or are stored.

User - the party seeking to use ASTM E 1527 to perform an environmental site assessment of the property. A user may include, without limitation, a purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager.

Visually and/or Physically Observed - during a site visit, this term means observations made by vision while walking through a property and the structures located on it and observations made by the sense of smell, particularly observations of noxious or foul odors.

Wastewater - water that (1) is or has been used in an industrial or manufacturing process, (2) conveys or has conveyed sewage, or (3) is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. Wastewater does not include water originating on or passing through or adjacent to a site, such as stormwater flows, that has not been used in industrial or manufacturing processes, has not been combined with sewage, or is not directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

APPENDIX E

EDR REPORT

ODOT Preble CO
234 Quaker Trace Rd
West Alexandria, OH 45381

Inquiry Number: 07728002.2r
August 06, 2024

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Government Records Searched/Data Currency Tracking	GR-1

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Physical Setting Source Summary	A-2
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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

234 QUAKER TRACE RD
WEST ALEXANDRIA, OH 45381

COORDINATES

Latitude (North):	39.7412030 - 39° 44' 28.33''
Longitude (West):	84.5742600 - 84° 34' 27.33''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	707856.9
UTM Y (Meters):	4401638.5
Elevation:	977 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	14434994 WEST ALEXANDRIA, OH
Version Date:	2019
North Map:	14434950 LEWISBURG, OH
Version Date:	2019

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20190829
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
234 QUAKER TRACE RD
WEST ALEXANDRIA, OH 45381

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	ODOT PREBLE COUNTY G	234 QUAKER TRACE RD	ARCHIVE UST		TP
A2	ODOT PREBLE COUNTY G	234 QUAKER TRACE RD	LUST, UST		TP
A3	ODOT PREBLE COUNTY G	234 QUAKER TRACE RD	UST FINDER, UST FINDER RELEASE		TP
A4	PREBLE CO GARAGE	234 QUACKER TRACE RD	RGA LUST		TP
A5	ODOT PREBLE COUNTY G	234 QUAKER TRACE RD	RGA LUST		TP
A6	ODOT EATON GARAGE	234 QUAKER TRACE RD	AST		TP
B7	PERSONNEL ALTERNATIV	3294 ST RTE 35 E	RCRA NonGen / NLR, FINDS, ECHO	Lower	434, 0.082, NNW
B8	SAVE A LOT GAS	3266 US 35	UST FINDER, UST FINDER RELEASE	Lower	463, 0.088, NNW
B9	SAVE A LOT GAS	3266 US 35	LUST, UST	Lower	463, 0.088, NNW
B10	SAVE A LOT GAS	3266 US 35	ARCHIVE UST	Lower	463, 0.088, NNW
11	RESIDENCE	33 QUINN RD	LUST	Lower	723, 0.137, NNW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
ODOT PREBLE COUNTY G 234 QUAKER TRACE RD WEST ALEXANDRIA, OH 45381	ARCHIVE UST Facility Number: 68000101 Tank Status: REM	N/A
ODOT PREBLE COUNTY G 234 QUAKER TRACE RD WEST ALEXANDRIA, OH 45381	LUST FR Status: NFA: No Further Action UST Facility Id: 68000101 Tank Status: REM - Removed	N/A
ODOT PREBLE COUNTY G 234 QUAKER TRACE RD WEST ALEXANDRIA, OH	UST FINDER UST FINDER RELEASE	N/A
PREBLE CO GARAGE 234 QUACKER TRACE RD WEST ALEXANDRIA, OH	RGA LUST	N/A
ODOT PREBLE COUNTY G 234 QUAKER TRACE RD WEST ALEXANDRIA, OH	RGA LUST	N/A
ODOT EATON GARAGE 234 QUAKER TRACE RD WEST ALEXANDRIA, OH 45321	AST Permit Number: 62.68.0004 Status: INACTIVE	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ---------- National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ---------- Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROLS ---------- Institutional Controls Sites List

Federal ERNS list

ERNS ---------- Emergency Response Notification System

Lists of state- and tribal hazardous waste facilities

SHWS ---------- This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.
DERR ---------- Division of Environmental Response and Revitalization Database

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF ---------- Licensed Solid Waste Facilities

Lists of state and tribal leaking storage tanks

LAST ---------- Leaking Aboveground Storage Tank Listing
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

UNREG LTANKS - Ohio Leaking UST File

Lists of state and tribal registered storage tanks

FEMA UST - Underground Storage Tank Listing
INDIAN UST - Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

HIST INST CONTROLS - Institutional Controls Database
HIST ENG CONTROLS - Operation & Maintenance Agreements Database
ENG CONTROLS - Sites with Engineering Controls
INST CONTROL - Sites with Institutional Engineering Controls

Lists of state and tribal voluntary cleanup sites

VCP - Voluntary Action Program Sites
INDIAN VCP - Voluntary Cleanup Priority Listing

Lists of state and tribal brownfield sites

BROWNFIELDS - Ohio Brownfield Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY - Recycling Facility Listing
HIST LF - Old Solid Waste Landfill
INDIAN ODI - Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 - Torres Martinez Reservation Illegal Dump Site Locations
ODI - Open Dump Inventory
IHS OPEN DUMPS - Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL - Delisted National Clandestine Laboratory Register
CDL - Clandestine Drug Lab Locations
US CDL - National Clandestine Laboratory Register

Local Land Records

LIENS 2 - CERCLA Lien Information

Records of Emergency Release Reports

HMIRS - Hazardous Materials Information Reporting System
SPILLS - Emergency Response Database
SPILLS 90 - SPILLS 90 data from FirstSearch
SPILLS 80 - SPILLS 80 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
MINES MRDS	Mineral Resources Data System
FINDS	Facility Index System/Facility Registry System
UXO	Unexploded Ordnance Sites
DOCKET HWC	Hazardous Waste Compliance Docket Listing
ECHO	Enforcement & Compliance History Information
FUELS PROGRAM	EPA Fuels Program Registered Listing
PFAS NPL	Superfund Sites with PFAS Detections Information
PFAS FEDERAL SITES	Federal Sites PFAS Information
PFAS TSCA	PFAS Manufacture and Imports Information
PFAS TRIS	List of PFAS Added to the TRI
PFAS RCRA MANIFEST	PFAS Transfers Identified In the RCRA Database Listing
PFAS ATSDR	PFAS Contamination Site Location Listing
PFAS WQP	Ambient Environmental Sampling for PFAS
PFAS PROJECT	NORTHEASTERN UNIVERSITY PFAS PROJECT
PFAS NPDES	Clean Water Act Discharge Monitoring Information
PFAS ECHO	Facilities in Industries that May Be Handling PFAS Listing
PFAS ECHO FIRE TRAIN	Facilities in Industries that May Be Handling PFAS Listing
PFAS PT 139 AIRPORT	All Certified Part 139 Airports PFAS Information Listing
AQUEOUS FOAM NRC	Aqueous Foam Related Incidents Listing
BIOSOLIDS	ICIS-NPDES Biosolids Facility Data

E MANIFEST ..... Hazardous Waste Electronic Manifest System
PFAS ..... PFOA & PFOS Site Listing
AIRS ..... Title V Permits Listing
ASBESTOS ..... Asbestos Notification Listing
COAL ASH ..... Coal Ash Disposal Site Listing
CRO ..... Cessation of Regulated Operations Facility Listing
DRYCLEANERS ..... Drycleaner Facility Listing
Financial Assurance ..... Financial Assurance Information Listing
HIST USD ..... Urban Setting Designations Database
LEAD ..... Lead Inspections Listing
NPDES ..... NPDES General Permit List
VAPOR ..... Vapor Intrusion
TOWNGAS ..... DERR Towngas Database
UIC ..... Underground Injection Wells Listing
USD ..... Urban Setting Designation Sites

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ..... EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ..... EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ..... Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state and tribal leaking storage tanks

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Commerce Division of State Fire Marshal's List of Reported Petroleum Underground Storage Tank Release Incidents.

A review of the LUST list, as provided by EDR, and dated 02/06/2024 has revealed that there are 2

LUST sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVE A LOT GAS	***3266 US 35***	***NNW 0 - 1/8 (0.088 mi.)***	***B9***	***20***
FR Status: NFA: No Further Action				
RESIDENCE	33 QUINN RD	NNW 1/8 - 1/4 (0.137 mi.)	11	25
FR Status: RPT: a possible incident is reported				

Lists of state and tribal registered storage tanks

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Commerce Division of State Fire Marshal's Facility File.

A review of the UST list, as provided by EDR, and dated 05/03/2024 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVE A LOT GAS	***3266 US 35***	***NNW 0 - 1/8 (0.088 mi.)***	***B9***	***20***
Facility Id: 68009660				
Tank Status: REM - Removed				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Registered Storage Tanks

ARCHIVE UST: Underground storage tank records that have been removed from the Underground Storage Tank database.

A review of the ARCHIVE UST list, as provided by EDR, and dated 05/03/2024 has revealed that there is 1 ARCHIVE UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVE A LOT GAS	3266 US 35	NNW 0 - 1/8 (0.088 mi.)	B10	23
Facility Number: 68009660				
Tank Status: REM				

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 06/03/2024 has revealed that

there is 1 RCRA NonGen / NLR site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PERSONNEL ALTERNATIV EPA ID:: OHD122543192	***3294 ST RTE 35 E***	***NNW 0 - 1/8 (0.082 mi.)***	***B7***	***15***

UST FINDER: EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories . UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

A review of the UST FINDER list, as provided by EDR, and dated 06/08/2023 has revealed that there is 1 UST FINDER site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVE A LOT GAS	***3266 US 35***	***NNW 0 - 1/8 (0.088 mi.)***	***B8***	***18***

UST FINDER RELEASE: US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

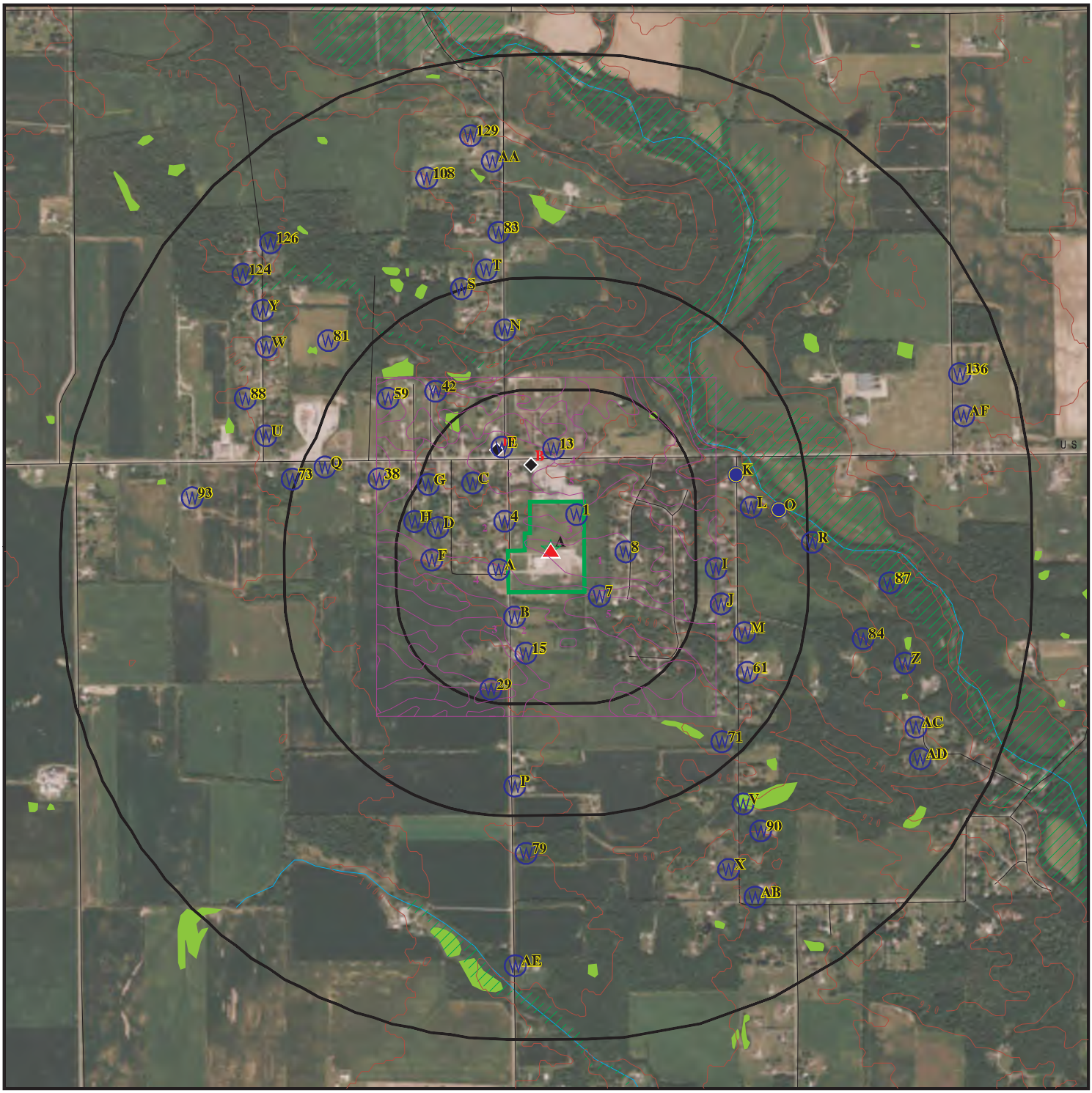
A review of the UST FINDER RELEASE list, as provided by EDR, and dated 06/08/2023 has revealed that there is 1 UST FINDER RELEASE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SAVE A LOT GAS	***3266 US 35***	***NNW 0 - 1/8 (0.088 mi.)***	***B8***	***18***

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 07728002.2R



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	ODOT Preble CO	CLIENT:	Resource International
ADDRESS:	234 Quaker Trace Rd West Alexandria OH 45381	CONTACT:	Kristy Engel-Shepard
		INQUIRY #:	07728002.2r
LAT/LONG:	39.741203 / 84.57426	DATE:	August 06, 2024 6:38 pm

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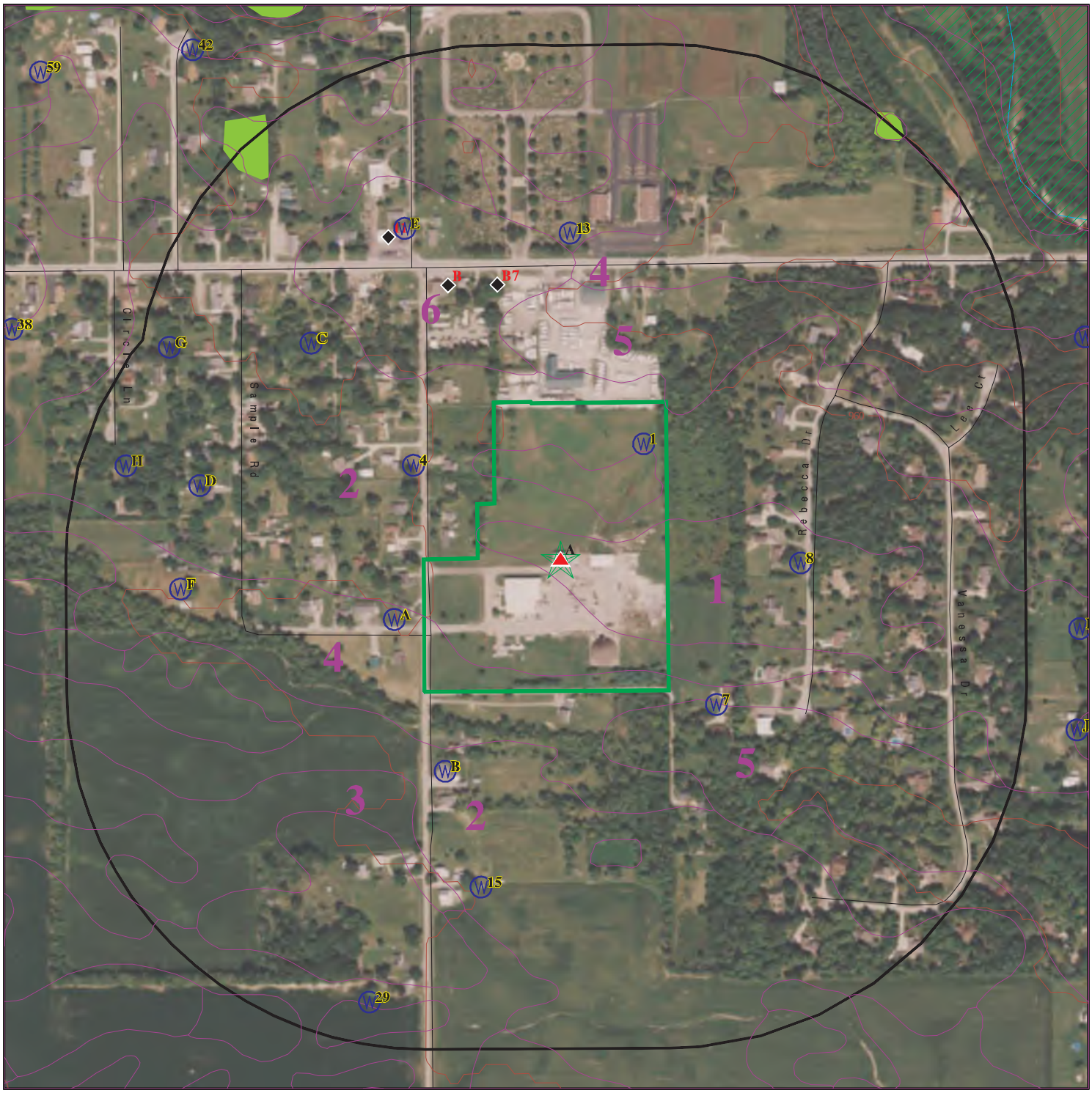
DETAIL MAP - 07728002.2R



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	ODOT Preble CO	CLIENT:	Resource International
ADDRESS:	234 Quaker Trace Rd West Alexandria OH 45381	CONTACT:	Kristy Engel-Shepard
		INQUIRY #:	07728002.2r
LAT/LONG:	39.741203 / 84.57426	DATE:	August 06, 2024 6:39 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal hazardous waste facilities								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
DERR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0
Lists of state and tribal leaking storage tanks								
LUST	0.500	1	1	1	0	NR	NR	3

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LAST	TP		NR	NR	NR	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
UNREG LTANKS	0.500		0	0	0	NR	NR	0
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250	1	1	0	NR	NR	NR	2
AST	0.250	1	0	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
HIST INST CONTROLS	0.500		0	0	0	NR	NR	0
HIST ENG CONTROLS	0.500		0	0	0	NR	NR	0
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
ARCHIVE UST	0.250	1	1	0	NR	NR	NR	2
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SPILLS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
SPILLS 80	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		1	0	NR	NR	NR	1
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
MINES MRDS	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS PROJECT	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAIN	0.250		0	0	NR	NR	NR	0
PFAS PT 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
BIOSOLIDS	0.001		0	NR	NR	NR	NR	0
UST FINDER	0.250	1	1	0	NR	NR	NR	2
UST FINDER RELEASE	0.500	1	1	0	0	NR	NR	2
E MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
ASBESTOS	0.001		0	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
CRO	0.001		0	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HIST USD	0.500		0	0	0	NR	NR	0
LEAD	0.001		0	NR	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
VAPOR	0.500		0	0	0	NR	NR	0
TOWNGAS	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
USD	0.500		0	0	0	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001	2	0	NR	NR	NR	NR	2
- Totals --		8	6	1	0	0	0	15

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

A1 **ODOT PREBLE COUNTY GARAGE** **ARCHIVE UST** **U004097610**
Target **234 QUAKER TRACE RD** **N/A**
Property **WEST ALEXANDRIA, OH 45381**

Site 1 of 6 in cluster A

Actual:
977 ft.

ARCHIVE UST:

Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Facility Number:	68000101
Owner Name:	OHIO DEPT. OF TRANSPORTATION
Owner Address:	1980 WEST BROAD STREET 3RD FLOOR
Owner City,St,Zip:	COLUMBUS, OH 43223
Owner Telephone:	(614)466-7925
Owner ID:	W000014
Facility Type:	State Government
Contact Name:	Not reported
Contact Telephone:	Not reported
Tank Number:	Not reported
Depth at Location:	WEST ALEXANDRIA FIRE DEPARTMENT
Authorized:	No
Eligible Award:	Not reported
Action:	No

Permit:

Facility Id:	68000101
Permit Id:	P00001
Permit Status:	Expired
Issued Date:	10/21/1999
LFD Permit Id:	Not reported

Facility Id:	68000101
Permit Id:	P00002
Permit Status:	Closed
Issued Date:	8/23/2005
LFD Permit Id:	Not reported

Inspection:

Facility Id:	68000101
Permit Number:	P00001
Code:	103
Inspection Type:	Final

Tank ID:	T00001
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	10/23/1998
Date Last Use:	10/23/1998

ODOT PREBLE COUNTY GARAGE (Continued) **U004097610**

Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00002
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	10/23/1998
Date Last Use:	10/23/1998
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00003
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	10/23/1998
Date Last Use:	10/23/1998
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

A2 **ODOT PREBLE COUNTY GARAGE** **LUST U004212351**
Target **234 QUAKER TRACE RD** **UST N/A**
Property **WEST ALEXANDRIA, OH 45381**

Site 2 of 6 in cluster A

Actual:
977 ft.

LUST:

Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Release Number:	68000101 - N00001
Release Date:	10/23/1998
LTF Status:	6 Closure of regulated UST
FR Status:	**NFA: No Further Action**
Priority:	Not reported
Review Date:	04/27/2000
Priority Decode:	Not reported
Class1 Decode:	A viable RP have been identified
Latitude:	39.7407
Longitude:	-84.57404
Class:	Viable Responsible Party has been identified
Incident Number:	688147800.0
Last Update:	Charles Zepp
Last Update Date:	03/07/2014
Last Update Updated:	04/15/2008
Sub Status:	Not reported
Rules:	1992
Coordinator:	Not reported
Rating:	0

UST:

Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Facility Id:	68000101
Owner Name:	OHIO DEPT. OF TRANSPORTATION (ODOT)
Owner Address:	1980 WEST BROAD STREET 3RD FLOOR
Owner City/State/Zip:	43223
Tank Number:	T00001
Status:	REM - Removed
UST Capacity:	2000
Tank Content:	Gasoline
Installation Date:	10/01/1972
Construction:	FRP-Fiberglass Reinforced Plastic
Date Last Used:	10/23/1998
Date TCL Closed:	Not reported
Date Removed:	10/23/1998
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Fiberglass Reinforced Plastic
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported

ODOT PREBLE COUNTY GARAGE (Continued) **U004212351**

Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	S - Suction
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Bare Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381

Tank Number:	T00002
Status:	REM - Removed
UST Capacity:	8000
Tank Content:	Diesel
Installation Date:	10/01/1972
Construction:	FRP-Fiberglass Reinforced Plastic
Date Last Used:	10/23/1998
Date TCL Closed:	Not reported
Date Removed:	10/23/1998
CAS Number:	68334-30-5
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Fiberglass Reinforced Plastic
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	S - Suction
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Bare Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	ODOT PREBLE COUNTY GARAGE

ODOT PREBLE COUNTY GARAGE (Continued) **U004212351**

Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Tank Number:	T00003
Status:	REM - Removed
UST Capacity:	1000
Tank Content:	Used Oil
Installation Date:	11/01/1974
Construction:	BM - Bare Metal
Date Last Used:	10/23/1998
Date TCL Closed:	Not reported
Date Removed:	10/23/1998
CAS Number:	Not reported
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Steel
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	NA - Not Applicable
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Bare Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

A3 Target Property **ODOT PREBLE COUNTY GARAGE**
234 QUAKER TRACE RD
WEST ALEXANDRIA, OH

UST FINDER **1028618857**
UST FINDER RELEASE **N/A**

Site 3 of 6 in cluster A

Actual: 977 ft.

UST FINDER:

Object ID:	335524
Facility ID:	OH68000101
Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH
Address Match Type:	Not reported
Open USTs:	0
Closed USTs:	3
TOS USTs:	0
Population 1500ft:	182
Private Wells 1500ft:	35
Within 100yr Floodplain:	No

ODOT PREBLE COUNTY GARAGE (Continued) **1028618857**

Land Use:	Developed, Low Intensity
Within SPA:	No
SPA PWS Facility ID:	Not reported
SPA Water Type:	Not reported
SPA Facility Type:	Not reported
SPA HUC12:	Not reported
Within WHPA:	No
WHPA PWS Facility ID:	Not reported
WHPA Water Type:	Not reported
WHPA Facility Type:	Not reported
WHPA HUC12:	Not reported
Facility Status:	Closed UST(s)
Date of Last Inspection:	Not reported
EPA Region:	5
Tribe:	Not reported
Coordinate Source:	State
X Coord:	-84.57404
Y Coord:	39.7407000000001
Latitude:	39.7407
Longitude:	-84.57404

UST FINDER:

Object ID:	1469611
Facility ID:	OH68000101
Tank ID:	OH68000101_T00003
Tank Status:	Closed
Installation Date:	1974/11/01 16:00:00+00
Removal Date:	1998/10/23 15:59:59+00
Tank Capacity:	1000
Substances:	Used Oil
Tank Wall Type:	Single

Object ID:	1469612
Facility ID:	OH68000101
Tank ID:	OH68000101_T00001
Tank Status:	Closed
Installation Date:	1972/10/01 16:00:00+00
Removal Date:	1998/10/23 15:59:59+00
Tank Capacity:	2000
Substances:	Gasoline
Tank Wall Type:	Single

Object ID:	1469613
Facility ID:	OH68000101
Tank ID:	OH68000101_T00002
Tank Status:	Closed
Installation Date:	1972/10/01 16:00:00+00
Removal Date:	1998/10/23 15:59:59+00
Tank Capacity:	8000
Substances:	Diesel
Tank Wall Type:	Single

UST FINDER RELEASE:

Object ID:	300541
Facility ID:	OH68000101
Lust ID:	OH68000101-N00001

ODOT PREBLE COUNTY GARAGE (Continued) **1028618857**

Name:	ODOT PREBLE COUNTY GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 0
Address Match Type:	Not reported
Reported Date:	1998/10/23 15:59:59+00
Status:	No Further Action
Substance:	Not reported
Population within 1500ft:	182
Domestic Wells within 1500ft:	35
Land Use:	Developed, Low Intensity
Within SPA:	No
SPA PWS Facility ID:	Not reported
SPA Water Type:	Not reported
SPA Facility Type:	Not reported
SPA HUC12:	Not reported
Within WHPA:	No
WHPA PWS Facility ID:	Not reported
WHPA Water Type:	Not reported
WHPA Facility Type:	Not reported
WHPA HUC12:	Not reported
Within 100yr Floodplain:	No
Tribe:	Not reported
EPA Region:	5
NFA Letter 1:	Not reported
NFA Letter 2:	Not reported
NFA Letter 3:	Not reported
NFA Letter 4:	Not reported
Closed With Residual Contaminate:	Not reported
Coordinate Source:	State
X Coord:	-84.57404
Y Coord:	39.7407000000001
Latitude:	39.7406999999999
Longitude:	-84.5740399999999

A4 **PREBLE CO GARAGE** **RGA LUST** **S114783548**
Target Property **234 QUACKER TRACE RD** **N/A**
WEST ALEXANDRIA, OH

Site 4 of 6 in cluster A

Actual: 977 ft.

RGA LUST:

1999	PREBLE CO GARAGE	234 QUACKER TRACE RD
1998	PREBLE CO GARAGE	234 QUACKER TRACE RD

A5 **ODOT PREBLE COUNTY GARAGE** **RGA LUST** **S114779887**
Target Property **234 QUAKER TRACE RD** **N/A**
WEST ALEXANDRIA, OH

Site 5 of 6 in cluster A

Actual: 977 ft.

RGA LUST:

2012	ODOT PREBLE COUNTY GARAGE	234 QUAKER TRACE RD
2011	ODOT PREBLE COUNTY GARAGE	234 QUAKER TRACE RD
2010	ODOT PREBLE COUNTY GARAGE	234 QUAKER TRACE RD
2009	ODOT PREBLE COUNTY GARAGE	234 QUAKER TRACE RD
2008	ODOT PREBLE COUNTY GARAGE	234 QUAKER TRACE RD

A6 **ODOT EATON GARAGE** **AST** **A100391667**
Target **234 QUAKER TRACE RD** **N/A**
Property **WEST ALEXANDRIA, OH 45321**

Site 6 of 6 in cluster A

Actual:
977 ft.

AST:

Name:	ODOT EATON GARAGE
Address:	234 QUAKER TRACE RD
City,State,Zip:	WEST ALEXANDRIA, OH 45321
Facility Attention:	Not reported
Permit Number:	62.68.0004
Owner Name:	Not reported
Owner Attention:	Not reported
Owner Address:	Not reported
Owner City:	Not reported
Owner State:	Not reported
Owner Zip:	Not reported
Latitude:	0
Longitude:	0
Tank Size:	Not reported
Tank Contents:	Not reported
Status:	INACTIVE

B7 **PERSONNEL ALTERNATIVES INC** **RCRA NonGen / NLR** **1000385307**
NNW **3294 ST RTE 35 E** **FINDS** **OHD122543192**
< 1/8 **WEST ALEXANDRIA, OH 45381** **ECHO**
0.082 mi.
434 ft. **Site 1 of 4 in cluster B**

Relative:
Lower

Actual:
965 ft.

RCRA Listings:

Date Form Received by Agency:	19970625
Handler Name:	Personnel Alternatives Inc
Handler Address:	3294 St Rte 35 E
Handler City,State,Zip:	WEST ALEXANDRIA, OH 45381
EPA ID:	OHD122543192
Contact Name:	JERRY WICK
Contact Address:	PO BOX 142
Contact City,State,Zip:	WEST ALEXANDRIA, OH 45381
Contact Telephone:	513-839-5123
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	05
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Oh
State District:	SW
Mailing Address:	PO BOX 142
Mailing City,State,Zip:	WEST ALEXANDRIA, OH 45381
Owner Name:	Wick Ruth And Jerry
Owner Type:	Private
Operator Name:	Name Not Reported
Operator Type:	Private
Short-Term Generator Activity:	No
Importer Activity:	No

PERSONNEL ALTERNATIVES INC (Continued) **1000385307**

Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20150414
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Hazardous Waste Summary:

Waste Code:	D001
Waste Description:	Ignitable Waste
Waste Code:	F003
Waste Description:	The Following Spent Nonhalogenated Solvents: Xylene, Acetone, Ethyl Acetate, Ethyl Benzene, Ethyl Ether, Methyl Isobutyl Ketone, N-Butyl Alcohol, Cyclohexanone, And Methanol; All Spent Solvent Mixtures/Blends Containing, Before Use, Only The Above Spent Nonhalogenated Solvents; And All Spent Solvent Mixtures/Blends Containing, Before Use, One Or More Of The Above Nonhalogenated Solvents, And A Total Of Ten Percent Or More (By Volume) Of One Or More Of Those Solvents Listed In F001, F002, F004, And F005; And Still Bottoms From The Recovery Of These Spent Solvents And Spent Solvent Mixtures.
Waste Code:	F005

PERSONNEL ALTERNATIVES INC (Continued) **1000385307**

Waste Description: The Following Spent Nonhalogenated Solvents: Toluene, Methyl Ethyl Ketone, Carbon Disulfide, Isobutanol, Pyridine, Benzene, 2-Ethoxyethanol, And 2-Nitropropane; All Spent Solvent Mixtures/Blends Containing, Before Use, A Total Of Ten Percent Or More (By Volume) Of One Or More Of The Above Nonhalogenated Solvents Or Those Solvents Listed In F001, F002, Or F004; And Still Bottoms From The Recovery Of These Spent Solvents And Spent Solvent Mixtures.

Handler - Owner Operator:

Owner/Operator Indicator:	Operator
Owner/Operator Name: NAME NOT REPORTED	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	ADDRESS NOT REPORTED
Owner/Operator City,State,Zip:	CITY NOT REPORTED, AK 99998
Owner/Operator Telephone:	312-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name: WICK RUTH AND JERRY	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	ADDRESS NOT REPORTED
Owner/Operator City,State,Zip:	CITY NOT REPORTED, AK 99998
Owner/Operator Telephone:	312-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	19970625
Handler Name: PERSONNEL ALTERNATIVES INC	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Oh
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Codes:	No NAICS Codes Found

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

PERSONNEL ALTERNATIVES INC (Continued) **1000385307**

FINDS:
Registry ID: 110006106631

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The Resource Conservation and Recovery Act Information System (RCRAInfo) is EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. It tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000385307
Registry ID:	110006106631
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110006106631
Name:	PERSONNEL ALTERNATIVES INC
Address:	3294 ST RTE 35 E
City,State,Zip:	WEST ALEXANDRIA, OH 45381

B8 **SAVE A LOT GAS** **UST FINDER** **1028618923**
NNW **3266 US 35** **UST FINDER RELEASE** **N/A**
< 1/8 **WEST ALEXANDRIA, OH**
0.088 mi.
463 ft. **Site 2 of 4 in cluster B**

Relative: **Lower**
Actual: **968 ft.**

UST FINDER:

Object ID:	335550
Facility ID:	OH68009660
Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH
Address Match Type:	Not reported
Open USTs:	0
Closed USTs:	3
TOS USTs:	0
Population 1500ft:	169
Private Wells 1500ft:	35
Within 100yr Floodplain:	No
Land Use:	Developed, Low Intensity
Within SPA:	No
SPA PWS Facility ID:	Not reported
SPA Water Type:	Not reported
SPA Facility Type:	Not reported
SPA HUC12:	Not reported
Within WHPA:	Yes
WHPA PWS Facility ID:	OH6801612_17267
WHPA Water Type:	GW - Ground water
WHPA Facility Type:	WL - Well
WHPA HUC12:	050800020301
Facility Status:	Closed UST(s)
Date of Last Inspection:	Not reported
EPA Region:	5
Tribe:	Not reported

SAVE A LOT GAS (Continued) **1028618923**

Coordinate Source:	State
X Coord:	-84.57544
Y Coord:	39.743863
Latitude:	39.743863
Longitude:	-84.57544

UST FINDER:

Object ID:	1443786
Facility ID:	OH68009660
Tank ID:	OH68009660_T00001
Tank Status:	Closed
Installation Date:	Not reported
Removal Date:	1992/06/01 15:59:59+00
Tank Capacity:	2000
Substances:	Gasoline
Tank Wall Type:	Single

Object ID:	1443787
Facility ID:	OH68009660
Tank ID:	OH68009660_T00003
Tank Status:	Closed
Installation Date:	Not reported
Removal Date:	1992/06/01 15:59:59+00
Tank Capacity:	6000
Substances:	Gasoline
Tank Wall Type:	Single

Object ID:	1443788
Facility ID:	OH68009660
Tank ID:	OH68009660_T00002
Tank Status:	Closed
Installation Date:	Not reported
Removal Date:	1992/06/01 15:59:59+00
Tank Capacity:	4000
Substances:	Gasoline
Tank Wall Type:	Single

UST FINDER RELEASE:

Object ID:	300574
Facility ID:	OH68009660
Lust ID:	OH68009660-N00001
Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 0
Address Match Type:	Not reported
Reported Date:	Not reported
Status:	No Further Action
Substance:	Not reported
Population within 1500ft:	169
Domestic Wells within 1500ft:	35
Land Use:	Developed, Low Intensity
Within SPA:	No
SPA PWS Facility ID:	Not reported
SPA Water Type:	Not reported
SPA Facility Type:	Not reported
SPA HUC12:	Not reported

SAVE A LOT GAS (Continued) **1028618923**

Within WHPA:	Yes
WHPA PWS Facility ID:	OH6801612_17267
WHPA Water Type:	GW - Ground water
WHPA Facility Type:	WL - Well
WHPA HUC12:	050800020301
Within 100yr Floodplain:	No
Tribe:	Not reported
EPA Region:	5
NFA Letter 1:	Not reported
NFA Letter 2:	Not reported
NFA Letter 3:	Not reported
NFA Letter 4:	Not reported
Closed With Residual Contaminate:	Not reported
Coordinate Source:	State
X Coord:	-84.57544
Y Coord:	39.74386
Latitude:	39.7438599999999
Longitude:	-84.57544

B9 **SAVE A LOT GAS** **LUST U004212392**
NNW **3266 US 35** **UST N/A**
< 1/8 **WEST ALEXANDRIA, OH 45381**
0.088 mi.
463 ft. **Site 3 of 4 in cluster B**

Relative: **Lower**

Actual: **968 ft.**

LUST:

Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Release Number:	68009660 - N00001
Release Date:	Not reported
LTF Status:	6 Closure of regulated UST
FR Status:	**NFA: No Further Action**
Priority:	3
Review Date:	06/20/2000
Priority Decode:	SUS/CON from AST
Class1 Decode:	A viable RP have been identified
Latitude:	39.743863
Longitude:	-84.57544
Class:	Viable Responsible Party has been identified
Incident Number:	682181800.0
Last Update:	Not reported
Last Update Date:	04/28/2012
Last Update Updated:	Not reported
Sub Status:	Not reported
Rules:	Not reported
Coordinator:	Brian Tarver
Rating:	Not reported

UST:

Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Facility Id:	68009660
Owner Name:	Not reported
Owner Address:	Not reported
Owner City/State/Zip:	Not reported

SAVE A LOT GAS (Continued) **U004212392**

Tank Number:	T00001
Status:	REM - Removed
UST Capacity:	2000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	BM - Bare Metal
Date Last Used:	12/01/1989
Date TCL Closed:	Not reported
Date Removed:	06/01/1992
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Steel
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	S - Suction
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Galvanized Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported
Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Tank Number:	T00002
Status:	REM - Removed
UST Capacity:	4000
Tank Content:	Diesel
Installation Date:	Not reported
Construction:	BM - Bare Metal
Date Last Used:	12/01/1989
Date TCL Closed:	Not reported
Date Removed:	06/01/1992
CAS Number:	Not reported
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Steel
Corrosion Protections:	Not reported

SAVE A LOT GAS (Continued) **U004212392**

Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	S - Suction
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Galvanized Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 45381

Tank Number:	T00003
Status:	REM - Removed
UST Capacity:	6000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	BM - Bare Metal
Date Last Used:	12/01/1989
Date TCL Closed:	Not reported
Date Removed:	06/01/1992
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Steel
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	S - Suction
Piping Constructions:	BM - Bare Metal
Piping Construction Comments:	Galvanized Steel
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No

SAVE A LOT GAS (Continued) **U004212392**

Comments: Not reported

B10 **SAVE A LOT GAS** **ARCHIVE UST** **U004100524**
NNW **3266 US 35** **N/A**
< 1/8 **WEST ALEXANDRIA, OH 45381**
0.088 mi.
463 ft. **Site 4 of 4 in cluster B**

Relative:
Lower

Actual:
968 ft.

ARCHIVE UST:

Name:	SAVE A LOT GAS
Address:	3266 US 35
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Facility Number:	68009660
Owner Name:	SAVE A LOT GAS
Owner Address:	3266 US 35
Owner City,St,Zip:	WEST ALEXANDRIA, OH 45381
Owner Telephone:	Not reported
Owner ID:	W018774
Facility Type:	Not reported
Contact Name:	Not reported
Contact Telephone:	Not reported
Tank Number:	Not reported
Depth at Location:	Zero
Authorized:	No
Eligible Award:	Not reported
Action:	No

Permit:

Facility Id:	68009660
Permit Id:	P00001
Permit Status:	Expired
Issued Date:	1/28/1994
LFD Permit Id:	Not reported

Inspection:

Facility Id:	68009660
Permit Number:	P00001
Code:	103
Inspection Type:	Final

Tank ID:	T00001
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	6/1/1992
Date Last Use:	12/1/1989
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported

SAVE A LOT GAS (Continued) **U004100524**

Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00002
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	6/1/1992
Date Last Use:	12/1/1989
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

Tank ID:	T00003
Tank Type:	Not reported
Tank Status:	**Removed**
Install Date:	Not reported
Content:	Not reported
Capacity:	Not reported
Corrosion Protection Tank:	Not reported
CAS #:	Not reported
Regulated:	Yes
Overfill Device Installed:	No
Spill Device Installed:	No
Release Detection On Tank:	Not reported
Date Removed:	6/1/1992
Date Last Use:	12/1/1989
Date Abandoned/Closed:	Not reported
AST/UST:	UST
Corrosion Protection Piping:	Not reported
Piping Material:	Not reported
Piping Type:	Not reported
Release Detection On Piping:	Not reported

11
NNW
1/8-1/4
0.137 mi.
723 ft.

RESIDENCE
33 QUINN RD
WEST ALEXANDRIA, OH 45381

LUST **S127295279**
N/A

Relative:
Lower

Actual:
970 ft.

LUST:

Name:	RESIDENCE
Address:	33 QUINN RD
City,State,Zip:	WEST ALEXANDRIA, OH 45381
Release Number:	68009663 - N00001
Release Date:	10/18/1994
LTF Status:	5 Petro incident, not from spill/overfill/release
FR Status:	**RPT: a possible incident is reported**
Priority:	2
Review Date:	11/22/2004
Priority Decode:	SUS/CON from non-regulated UST
Class1 Decode:	A Responsible Party (RP) for the release has not yet been determined
Latitude:	39.744597
Longitude:	-84.576578
Class:	Responsible Party for release has not yet been determined
Incident Number:	684188000.0
Last Update:	Not reported
Last Update Date:	04/28/2012
Last Update Updated:	05/28/2002
Sub Status:	Not reported
Rules:	1992
Coordinator:	Raymond Bauman
Rating:	14

Count: 0 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 23

Source: EPA
Telephone: N/A
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 23

Source: EPA
Telephone: N/A
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 23

Source: EPA
Telephone: N/A
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 03/25/2024
Date Data Arrived at EDR: 03/26/2024
Date Made Active in Reports: 06/24/2024
Number of Days to Update: 90

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 06/25/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/22/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 05/24/2024
Number of Days to Update: 23

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/22/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 05/24/2024
Number of Days to Update: 23

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/14/2024
Date Data Arrived at EDR: 02/16/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 48

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 07/31/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/13/2024
Date Data Arrived at EDR: 02/21/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 43

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/13/2024
Date Data Arrived at EDR: 02/21/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 43

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 03/13/2024
Date Data Arrived at EDR: 03/19/2024
Date Made Active in Reports: 06/17/2024
Number of Days to Update: 90

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 06/17/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Ohio EPA
Telephone: 614-644-2924
Last EDR Contact: 07/24/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: N/A

DERR: Division of Emergency & Remedial Response's Database

The DERR listings contains sites from all of Ohio that are in the Division of Environmental Response and Revitalization (DERR) database, which is an index of sites for which our district offices maintain files. The database is NOT a record of contaminated sites or sites suspected of contamination. Not all sites in the database are contaminated, and a site's absence from the database does not imply that it is uncontaminated.

Date of Government Version: 04/19/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/25/2024
Number of Days to Update: 85

Source: Ohio EPA
Telephone: 614-644-3538
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF: Licensed Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 06/28/2024
Date Data Arrived at EDR: 06/28/2024
Date Made Active in Reports: 07/02/2024
Number of Days to Update: 4

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2621
Last EDR Contact: 06/28/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Semi-Annually

Lists of state and tribal leaking storage tanks

LAST: Leaking Aboveground Storage Tank Listing

Suspected/confirmed release from Aboveground storage tank sites.

Date of Government Version: 02/06/2024
Date Data Arrived at EDR: 02/08/2024
Date Made Active in Reports: 04/30/2024
Number of Days to Update: 82

Source: Department of Commerce
Telephone: 614-752-7928
Last EDR Contact: 07/31/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: N/A

LUST: Leaking Underground Storage Tank File

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 02/06/2024
Date Data Arrived at EDR: 02/08/2024
Date Made Active in Reports: 04/30/2024
Number of Days to Update: 82

Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 07/31/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/04/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/25/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

UNREG LTANKS: Ohio Leaking UST File
A suspected or confirmed release of petroleum from a non-regulated UST.

Date of Government Version: 08/25/1999
Date Data Arrived at EDR: 08/19/2003
Date Made Active in Reports: 08/26/2003
Number of Days to Update: 7
Source: Department of Commerce
Telephone: 614-752-7938
Last EDR Contact: 08/01/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 03/15/2024
Date Data Arrived at EDR: 03/19/2024
Date Made Active in Reports: 06/17/2024
Number of Days to Update: 90
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

UST: Underground Storage Tank Tank File
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 05/03/2024
Date Data Arrived at EDR: 05/07/2024
Date Made Active in Reports: 08/02/2024
Number of Days to Update: 87
Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: Quarterly

AST: Above Ground Storage Tanks
A listing of aboveground storage tank site locations in the state.

Date of Government Version: 10/28/2021
Date Data Arrived at EDR: 10/28/2021
Date Made Active in Reports: 01/24/2022
Number of Days to Update: 88
Source: Department of Commerce
Telephone: 614-752-7037
Last EDR Contact: 07/18/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/17/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/24/2023
Date Data Arrived at EDR: 01/17/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 56

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

HIST INST CONTROLS: Institutional Controls Database

"Institutional control" is a restriction that is recorded in the same manner as a deed which limits access to or use of the property such that exposure to hazardous substances or petroleum are effectively and reliably eliminated or mitigated. Examples of institutional controls include land and water use restrictions. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/06/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 28

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

HIST ENG CONTROLS: Operation & Maintenance Agreements Database

Volunteers that complete a voluntary action that relies on the ongoing operation and maintenance (O&M) of an engineered control to make the site protective (e.g" cap systems and ground water treatment systems) must enter into a legally binding agreement with the Ohio EPA before the director issues a covenant not to sue. This O&M Agreement must describe how the remedy is constructed and how itwill be monitored, maintained and repaired. It also lays out inspection opportunities for the agency. Companies must document that they have the financial capability to operate any remedy relied on, before the agency will agree to enter into the O&M Agreement. The statute requires that the agency be notified of any change in ownership. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 30

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

ENG CONTROLS: Sites with Engineering Controls

A database that tracks properties with engineering controls.

Date of Government Version: 04/19/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/25/2024
Number of Days to Update: 85

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

INST CONTROL: Sites with Institutional Engineering Controls

A database that tracks properties with institutional controls.

Date of Government Version: 04/19/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/25/2024
Number of Days to Update: 85

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2306
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

Lists of state and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 06/14/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Varies

VCP: Voluntary Action Program Sites
Site involved in the Voluntary Action Program.

Date of Government Version: 04/19/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/25/2024
Number of Days to Update: 85
Source: Ohio EPA, Voluntary Action Program
Telephone: 614-728-1298
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Ohio Brownfield Inventory
A statewide brownfields inventory. A brownfield is an abandoned, idled or under-used industrial or commercial property where expansion or redevelopment is complicated by known or potential releases of hazardous substances and/or petroleum.

Date of Government Version: 03/05/2024
Date Data Arrived at EDR: 03/06/2024
Date Made Active in Reports: 05/30/2024
Number of Days to Update: 85
Source: Ohio EPA
Telephone: 614-644-3748
Last EDR Contact: 06/05/2024
Next Scheduled EDR Contact: 09/16/2024
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 03/11/2024
Date Data Arrived at EDR: 03/12/2024
Date Made Active in Reports: 05/10/2024
Number of Days to Update: 59
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/11/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF: Old Solid Waste Landfill
A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s

Date of Government Version: 02/08/2024
Date Data Arrived at EDR: 03/06/2024
Date Made Active in Reports: 05/30/2024
Number of Days to Update: 85
Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 06/05/2024
Next Scheduled EDR Contact: 09/16/2024
Data Release Frequency: No Update Planned

SWRCY: Recycling Facility Listing
A listing of recycling facility locations.

Date of Government Version: 04/03/2024
Date Data Arrived at EDR: 04/05/2024
Date Made Active in Reports: 04/08/2024
Number of Days to Update: 3
Source: Ohio EPA
Telephone: 614-728-5357
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Quarterly

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/22/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/10/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 07/18/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 02/21/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 43

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/21/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Lab Locations

A list of clandestine drug lab sites with environmental impact. This list is extracted from the SPILLS database based on the "product" type.

Date of Government Version: 04/26/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/26/2024
Number of Days to Update: 86

Source: Ohio EPA
Telephone: 614-644-2080
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 02/21/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 43

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/21/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

ARCHIVE UST: Archived Underground Storage Tank Sites

Underground storage tank records that have been removed from the Underground Storage Tank database.

Date of Government Version: 05/03/2024
Date Data Arrived at EDR: 05/07/2024
Date Made Active in Reports: 08/02/2024
Number of Days to Update: 87

Source: Department of Commerce, Division of State Fire Marshal
Telephone: 614-752-7938
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 23

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/14/2024
Date Data Arrived at EDR: 06/17/2024
Date Made Active in Reports: 06/24/2024
Number of Days to Update: 7

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 06/17/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

SPILLS: Emergency Response Database

Incidents reported to the Emergency Response Unit. The focus of the ER program is to minimize the impact on the environment from accidental releases, spills, and unauthorized discharges from any fixed or mobile sources. Incidents involving petroleum products, hazardous materials, hazardous waste, abandoned drums, or other materials which may pose as a pollution threat to the state?s water, land, or air should be reported immediately. Not all incidents included in the database are actual SPILLS, they can simply be reported incidents.

Date of Government Version: 04/26/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/26/2024
Number of Days to Update: 86

Source: Ohio EPA
Telephone: 614-644-2084
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/13/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SPILLS 80: SPILLS80 data from FirstSearch

Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 04/24/2004
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/01/2013
Number of Days to Update: 57

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/03/2024
Date Data Arrived at EDR: 06/07/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/30/2024
Date Data Arrived at EDR: 02/13/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 51

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/14/2024
Next Scheduled EDR Contact: 08/26/2024
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/11/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/02/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/05/2024
Next Scheduled EDR Contact: 11/18/2024
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/18/2024
Date Data Arrived at EDR: 03/19/2024
Date Made Active in Reports: 06/20/2024
Number of Days to Update: 93

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 06/17/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA Watch List

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 07/25/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: No Update Planned

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/13/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 11/13/2023
Date Made Active in Reports: 02/07/2024
Number of Days to Update: 86

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/16/2024
Next Scheduled EDR Contact: 08/26/2024
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 07/11/2024
Date Data Arrived at EDR: 07/11/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 1

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/11/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 23

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 09/09/2024
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/01/2024
Date Data Arrived at EDR: 04/17/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/11/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 04/04/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 66

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/02/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/02/2024
Date Data Arrived at EDR: 01/16/2024
Date Made Active in Reports: 03/13/2024
Number of Days to Update: 57

Source: Nuclear Regulatory Commission
Telephone: 301-415-0717
Last EDR Contact: 07/11/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 11/27/2023
Date Made Active in Reports: 02/22/2024
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 05/28/2024
Next Scheduled EDR Contact: 09/09/2024
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 05/28/2024
Next Scheduled EDR Contact: 09/09/2024
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 06/21/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 07/23/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 03/31/2024
Date Data Arrived at EDR: 04/19/2024
Date Made Active in Reports: 06/26/2024
Number of Days to Update: 68

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/02/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023
Date Data Arrived at EDR: 03/03/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 98

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 07/24/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/16/2024
Next Scheduled EDR Contact: 08/26/2024
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 05/22/2024
Date Data Arrived at EDR: 06/03/2024
Date Made Active in Reports: 06/24/2024
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 10/07/2024
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/05/2024
Date Data Arrived at EDR: 02/21/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 43

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/21/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 04/01/2024
Date Data Arrived at EDR: 04/04/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 99

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 07/02/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 82

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/22/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/23/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 08/23/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 98

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/22/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 03/18/2024
Date Data Arrived at EDR: 03/19/2024
Date Made Active in Reports: 06/06/2024
Number of Days to Update: 79

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/13/2024
Next Scheduled EDR Contact: 09/16/2024
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/09/2024
Date Data Arrived at EDR: 02/27/2024
Date Made Active in Reports: 05/24/2024
Number of Days to Update: 87

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 05/29/2024
Next Scheduled EDR Contact: 09/09/2024
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/17/2024
Next Scheduled EDR Contact: 09/02/2024
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023
Date Data Arrived at EDR: 09/13/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 89

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 07/08/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 06/23/2024
Date Data Arrived at EDR: 06/28/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 06/28/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/12/2024
Date Data Arrived at EDR: 02/13/2024
Date Made Active in Reports: 04/04/2024
Number of Days to Update: 51

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/14/2024
Next Scheduled EDR Contact: 08/26/2024
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 07/18/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS PROJECT: NORTHEASTERN UNIVERSITY PFAS PROJECT

The PFAS Contamination Site Tracker records qualitative and quantitative data from each site in a chart, specifically examining discovery, contamination levels, government response, litigation, health impacts, media coverage, and community characteristics. All data presented in the chart were extracted from government websites, such as state health departments or the Environmental Protection Agency, and news articles.

Date of Government Version: 05/19/2023
Date Data Arrived at EDR: 04/05/2024
Date Made Active in Reports: 06/06/2024
Number of Days to Update: 62

Source: Social Science Environmental Health Research Institute
Telephone: N/A
Last EDR Contact: 06/04/2024
Next Scheduled EDR Contact: 09/16/2024
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS ECHO FIRE TRAIN: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PFAS PT 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 07/01/2024
Date Data Arrived at EDR: 07/01/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: 202-267-2675
Last EDR Contact: 07/01/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 12/16/2016
Date Data Arrived at EDR: 01/06/2017
Date Made Active in Reports: 03/10/2017
Number of Days to Update: 63

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 06/27/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: No Update Planned

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 06/27/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data
The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 04/14/2024
Date Data Arrived at EDR: 04/16/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 202-564-4700
Last EDR Contact: 07/16/2024
Next Scheduled EDR Contact: 10/28/2024
Data Release Frequency: Varies

UST FINDER: UST Finder Database
EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories . UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/04/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 106

Source: Environmental Protection Agency
Telephone: 202-564-0394
Last EDR Contact: 05/08/2024
Next Scheduled EDR Contact: 08/19/2024
Data Release Frequency: Varies

UST FINDER RELEASE: UST Finder Releases Database
US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/31/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 79

Source: Environmental Protecton Agency
Telephone: 202-564-0394
Last EDR Contact: 05/08/2024
Next Scheduled EDR Contact: 08/19/2024
Data Release Frequency: Semi-Annually

E MANIFEST: Hazardous Waste Electronic Manifest System
EPA established a national system for tracking hazardous waste shipments electronically. This system, known as ?e-Manifest,? will modernize the nation?s cradle-to-grave hazardous waste tracking process while saving valuable time, resources, and dollars for industry and states.

Date of Government Version: 07/24/2023
Date Data Arrived at EDR: 04/18/2024
Date Made Active in Reports: 06/06/2024
Number of Days to Update: 49

Source: Environmental Protection Agency
Telephone: 833-501-6826
Last EDR Contact: 06/07/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Varies

PFAS: PFOA & PFOS Site Listing
PFAS have been widely used in numerous industrial and residential applications since the 1950a??s. Their stability and unique chemical properties produce waterproof, stain resistant, and nonstick qualities in products. They are found in some firefighting foams and a wide range of consumer products such as carpet treatments, non-stick cookware, water-resistant fabrics, food packaging materials, and personal care products.

Date of Government Version: 10/06/2022
Date Data Arrived at EDR: 12/12/2022
Date Made Active in Reports: 02/27/2023
Number of Days to Update: 77

Source: Ohio EPA
Telephone: 614-644-2752
Last EDR Contact: 06/21/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Varies

AIRS: Title V Permits Listing

A listing of Title V Permits issued by the Division of Air Pollution Control. It is a federal operating permit program adopted and implemented by the state. The basic program elements typically specify that major sources will submit an operating application to the specified state environmental regulatory agency according to a schedule.

Date of Government Version: 03/11/2024
Date Data Arrived at EDR: 03/13/2024
Date Made Active in Reports: 06/07/2024
Number of Days to Update: 86

Source: Ohio EPA
Telephone: 614-644-2270
Last EDR Contact: 06/06/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Quarterly

ASBESTOS: Asbestos Notification Listing

A listing of notifications site locations with abatement and demolition dates.

Date of Government Version: 01/22/2024
Date Data Arrived at EDR: 01/24/2024
Date Made Active in Reports: 04/12/2024
Number of Days to Update: 79

Source: Ohio EPA
Telephone: 614-466-3770
Last EDR Contact: 07/23/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Site Listing

A listing of coal ash disposal site locations.

Date of Government Version: 04/13/2015
Date Data Arrived at EDR: 04/16/2015
Date Made Active in Reports: 05/29/2015
Number of Days to Update: 43

Source: Ohio EPA
Telephone: 614-644-2134
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

CRO: Cessation of Regulated Operations Facility Listing

"Cessation of Regulated Operations" means the discontinuation or termination of regulated operations or the finalizing of any transaction or proceeding through which those operations are discontinued. "Regulated Operations" means the production, use, storage or handling of regulated substances.

Date of Government Version: 01/10/2024
Date Data Arrived at EDR: 01/31/2024
Date Made Active in Reports: 04/22/2024
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-644-3065
Last EDR Contact: 08/01/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner Facility Listing

A listing of drycleaner facility locations.

Date of Government Version: 03/04/2024
Date Data Arrived at EDR: 03/19/2024
Date Made Active in Reports: 06/11/2024
Number of Days to Update: 84

Source: Ohio EPA
Telephone: 614-644-3469
Last EDR Contact: 06/14/2024
Next Scheduled EDR Contact: 09/30/2024
Data Release Frequency: Semi-Annually

FIN ASSURANCE: Financial Assurance Information Listing

Financial assurance information.

Date of Government Version: 12/05/2017
Date Data Arrived at EDR: 12/08/2017
Date Made Active in Reports: 01/08/2018
Number of Days to Update: 31

Source: Ohio EPA
Telephone: 614-644-2955
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Semi-Annually

FIN ASSURANCE 3: Financial Assurance3 Information Listing

Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 04/15/2024
Date Data Arrived at EDR: 04/16/2024
Date Made Active in Reports: 07/12/2024
Number of Days to Update: 87

Source: Ohio EPA
Telephone: 614-644-2621
Last EDR Contact: 07/11/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Varies

HIST USD: Urban Setting Designations Database

A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director's decision on approval or denial of the request is needed before cleanup requirements for the site can be determined. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/25/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 16

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

LEAD: Lead Inspections Listing

Department of Health lead inspections included in the Environmental Licensing System.

Date of Government Version: 03/12/2024
Date Data Arrived at EDR: 03/13/2024
Date Made Active in Reports: 06/11/2024
Number of Days to Update: 90

Source: Department of Health
Telephone: 614-466-3543
Last EDR Contact: 06/12/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Quarterly

NPDES: NPDES General Permit List

General information regarding NPDES (National Pollutant Discharge Elimination System) permits.

Date of Government Version: 04/26/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/30/2024
Number of Days to Update: 90

Source: Ohio EPA
Telephone: 614-644-2031
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Quarterly

VAPOR: Vapor Intrusion

A listing of vapor intrusion related sites.

Date of Government Version: 06/16/2020
Date Data Arrived at EDR: 06/18/2020
Date Made Active in Reports: 09/01/2020
Number of Days to Update: 75

Source: Ohio EPA
Telephone: 614-644-2924
Last EDR Contact: 06/06/2024
Next Scheduled EDR Contact: 09/23/2024
Data Release Frequency: Varies

TOWNGAS: DERR Towngas Database

The database includes 82 very old sites (circa 1895) which produced gas from coal for street lighting. Most visual evidence of these sites has disappeared, however the potential for buried coal tar remains. The database is no longer in active use.

Date of Government Version: 07/28/1992
Date Data Arrived at EDR: 02/21/2003
Date Made Active in Reports: 03/05/2003
Number of Days to Update: 12

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 02/12/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 01/30/2024
Date Data Arrived at EDR: 02/01/2024
Date Made Active in Reports: 04/23/2024
Number of Days to Update: 82

Source: Ohio EPA
Telephone: 614-644-2752
Last EDR Contact: 07/24/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Varies

USD: Urban Setting Designation Sites
A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director's decision on approval or denial of the request is needed before cleanup requirements for the site can be determined.

Date of Government Version: 04/30/2024
Date Data Arrived at EDR: 05/01/2024
Date Made Active in Reports: 07/26/2024
Number of Days to Update: 86

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 07/30/2024
Next Scheduled EDR Contact: 11/11/2024
Data Release Frequency: Semi-Annually

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Ohio Environmental Procetion Agency in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Ohio Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Commerce in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/20/2013
Number of Days to Update: 172

Source: Department of Commerce
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/05/2024
Date Data Arrived at EDR: 05/07/2024
Date Made Active in Reports: 08/01/2024
Number of Days to Update: 86

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/07/2024
Next Scheduled EDR Contact: 08/19/2024
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/26/2024
Next Scheduled EDR Contact: 10/14/2024
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 11/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 1

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 07/25/2024
Next Scheduled EDR Contact: 11/04/2024
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/03/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/13/2024
Next Scheduled EDR Contact: 08/26/2024
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data
Hazardous waste manifest information.

Date of Government Version: 10/28/2019
Date Data Arrived at EDR: 10/29/2019
Date Made Active in Reports: 01/09/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 07/03/2024
Next Scheduled EDR Contact: 10/21/2024
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/03/2024
Next Scheduled EDR Contact: 09/16/2024
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Child Day Care Facilities
Source: Department of Job & Family Services
Telephone: 614-466-6282

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

ODOT PREBLE CO
234 QUAKER TRACE RD
WEST ALEXANDRIA, OH 45381

TARGET PROPERTY COORDINATES

Latitude (North):	39.741203 - 39° 44' 28.33''
Longitude (West):	84.57426 - 84° 34' 27.34''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	707856.9
UTM Y (Meters):	4401638.5
Elevation:	977 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	14434994 WEST ALEXANDRIA, OH
Version Date:	2019
North Map:	14434950 LEWISBURG, OH
Version Date:	2019

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

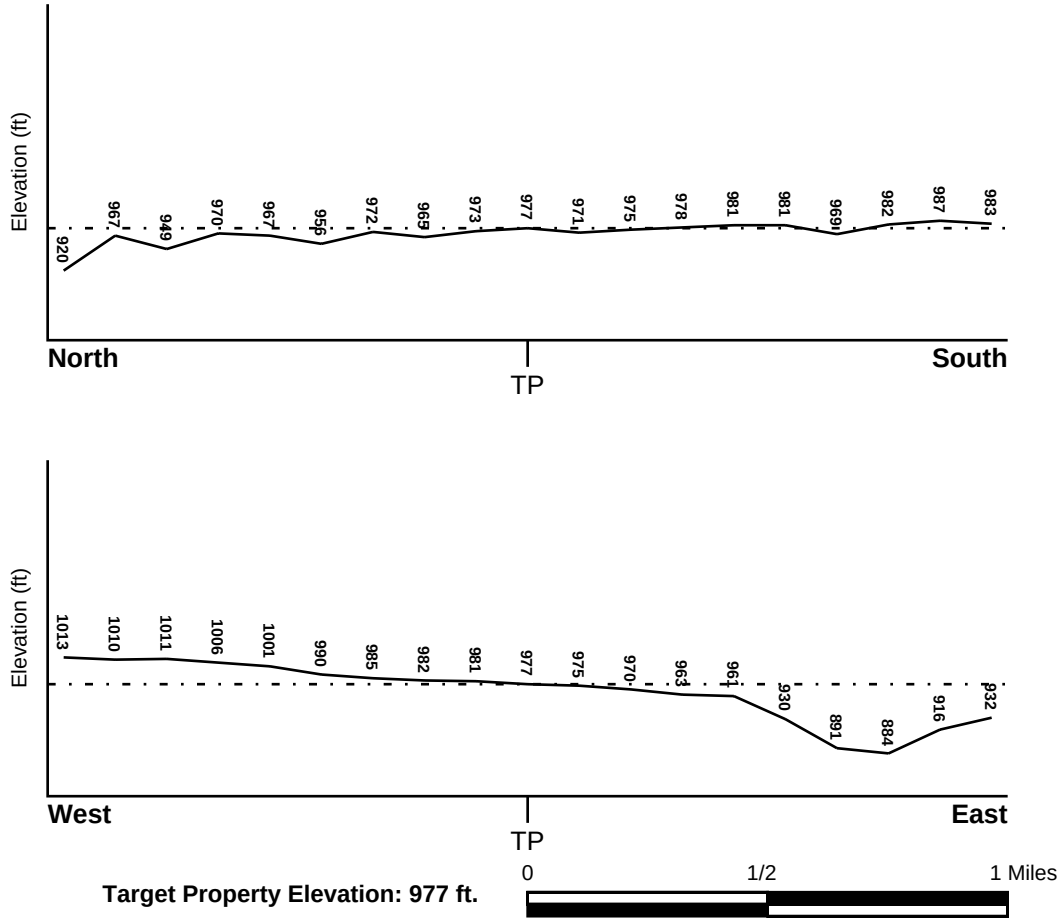
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General East

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
39135C0255D	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
39135C0165D	FEMA FIRM Flood data
39135C0170D	FEMA FIRM Flood data
39135C0260D	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
WEST ALEXANDRIA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

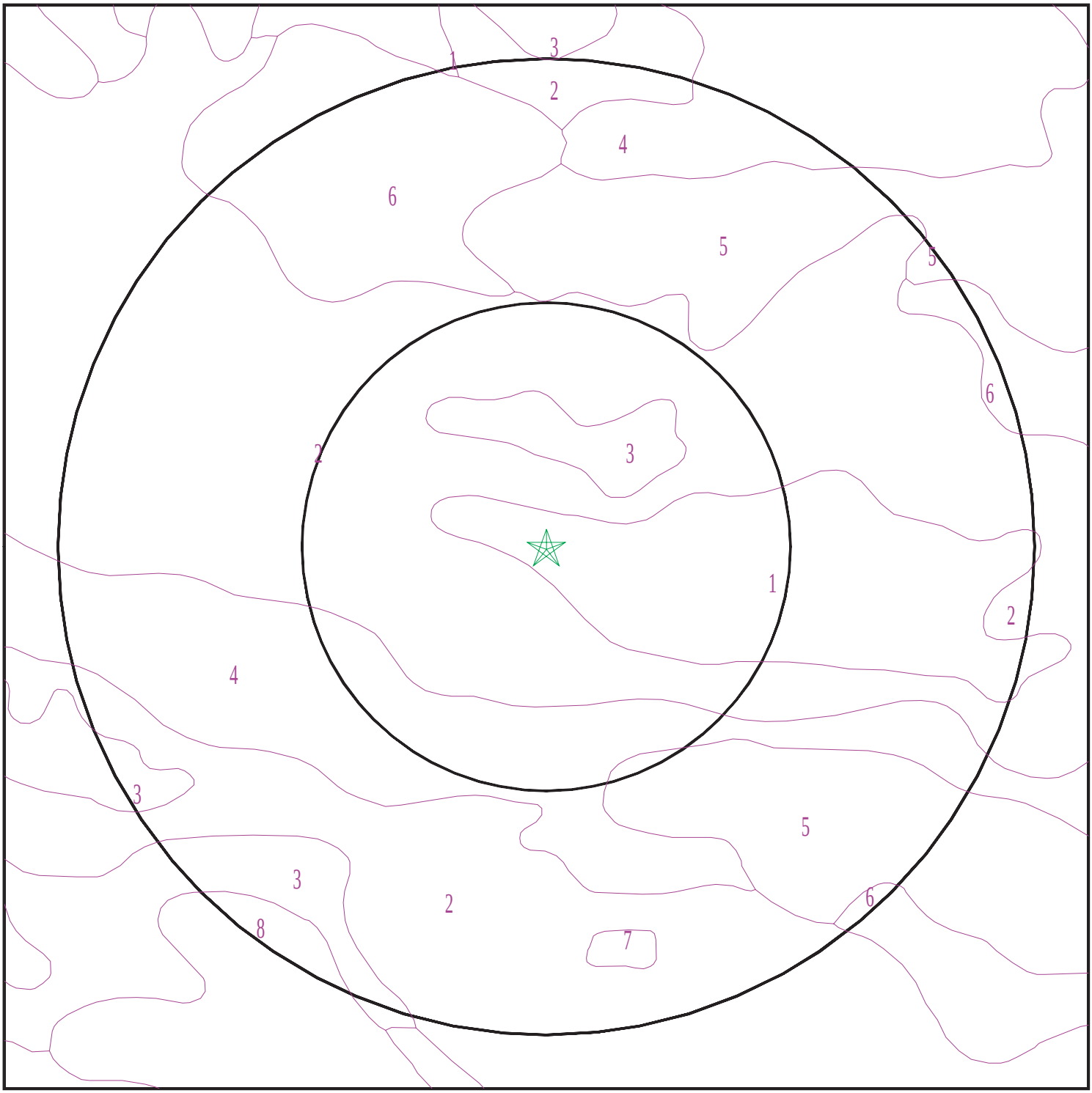
Era:	Paleozoic
System:	Ordovician
Series:	Upper Ordovician (Cincinnatian)
Code:	O3 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 07728002.2r



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	ODOT Preble CO	CLIENT:	Resource International
ADDRESS:	234 Quaker Trace Rd West Alexandria OH 45381	CONTACT:	Kristy Engel-Shepard
		INQUIRY #:	07728002.2r
LAT/LONG:	39.741203 / 84.57426	DATE:	August 06, 2024 6:39 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Crosby

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
2	9 inches	25 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
3	25 inches	38 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
4	38 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4

Soil Map ID: 2

Soil Component Name: Celina

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.42 Min: 0.07	Max: 8.4 Min: 7.4
2	9 inches	38 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.42 Min: 0.07	Max: 8.4 Min: 7.4
3	38 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.42 Min: 0.07	Max: 8.4 Min: 7.4

Soil Map ID: 3

Soil Component Name: Kokomo

Soil Surface Texture: silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Very poorly drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 8 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6
2	9 inches	50 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6
3	68 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6
4	50 inches	68 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 4.23 Min: 1.41	Max: 7.8 Min: 5.6

Soil Map ID: 4

Soil Component Name: Miamian

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
2	9 inches	24 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
3	24 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
4	35 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4

Soil Map ID: 5

Soil Component Name: Miamian

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 92 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
2	5 inches	18 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
3	18 inches	29 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	29 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4

Soil Map ID: 6

Soil Component Name: Miamian

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	9 inches	29 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
3	29 inches	35 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4
4	35 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.41 Min: 0.42	Max: 8.4 Min: 7.4

Soil Map ID: 7

Soil Component Name: Water

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class:
Hydric Status: Unknown

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 8

Soil Component Name: Crosby

Soil Surface Texture: silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 31 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
2	7 inches	20 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
3	20 inches	31 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4
4	31 inches	79 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.41 Min: 0.07	Max: 8.4 Min: 7.4

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
K48	USGS40000953347	1/4 - 1/2 Mile ENE
K49	USGS40000953346	1/4 - 1/2 Mile ENE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
O60	OH6800422	1/2 - 1 Mile ENE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	OHD900000470830	0 - 1/8 Mile NE
A2	OHD900000451931	0 - 1/8 Mile WSW
A3	OHD900000410138	0 - 1/8 Mile WSW
4	OHD900000268816	0 - 1/8 Mile WNW
A5	OHD900000712274	1/8 - 1/4 Mile WSW
B6	OHD900000338653	1/8 - 1/4 Mile SSW
7	OHD900000853867	1/8 - 1/4 Mile SE
8	OHD900000452617	1/8 - 1/4 Mile East
B9	OHD900000448938	1/8 - 1/4 Mile SSW
B10	OHD900000596854	1/8 - 1/4 Mile SSW
C11	OHD900000535383	1/8 - 1/4 Mile NW
D12	OHD900000451016	1/8 - 1/4 Mile WNW
13	OHD900000428515	1/8 - 1/4 Mile North
C14	OHD900000483211	1/8 - 1/4 Mile NW
15	OHD900000451030	1/8 - 1/4 Mile SSW
C16	OHD900000451021	1/8 - 1/4 Mile NW
E17	OHD900000428514	1/8 - 1/4 Mile NNW
C18	OHD900000451015	1/4 - 1/2 Mile NW
F19	OHD900000451020	1/4 - 1/2 Mile West

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
F20	OHD900000451019	1/4 - 1/2 Mile West
E21	OHD900000640296	1/4 - 1/2 Mile NNW
G22	OHD900000528593	1/4 - 1/2 Mile WNW
D23	OHD900000451018	1/4 - 1/2 Mile West
D24	OHD900000451017	1/4 - 1/2 Mile WNW
H25	OHD900000835065	1/4 - 1/2 Mile WNW
H26	OHD900000831587	1/4 - 1/2 Mile West
G27	OHD900000451014	1/4 - 1/2 Mile WNW
G28	OHD900000645729	1/4 - 1/2 Mile WNW
29	OHD900000451029	1/4 - 1/2 Mile SSW
I30	OHD900000803912	1/4 - 1/2 Mile East
I31	OHD900000451039	1/4 - 1/2 Mile East
I32	OHD900000451040	1/4 - 1/2 Mile ESE
J33	OHD900000449276	1/4 - 1/2 Mile ESE
J34	OHD900000449277	1/4 - 1/2 Mile ESE
J35	OHD900000406837	1/4 - 1/2 Mile ESE
I36	OHD900000799699	1/4 - 1/2 Mile East
K37	OHD900000451032	1/4 - 1/2 Mile ENE
38	OHD900000390639	1/4 - 1/2 Mile WNW
L39	OHD900000647923	1/4 - 1/2 Mile East
L40	OHD900000700242	1/4 - 1/2 Mile East
L41	OHD900000637666	1/4 - 1/2 Mile East
42	OHD900000428505	1/4 - 1/2 Mile NW
J43	OHD900000453237	1/4 - 1/2 Mile ESE
K44	OHWT40000003154	1/4 - 1/2 Mile ENE
K45	OHPWS8000004420	1/4 - 1/2 Mile ENE
K46	OHDM30000035094	1/4 - 1/2 Mile ENE
M47	OHD900000637656	1/4 - 1/2 Mile ESE
L50	OHD900000451035	1/4 - 1/2 Mile ENE
L51	OHD900000451034	1/4 - 1/2 Mile ENE
L52	OHD900000451033	1/4 - 1/2 Mile ENE
L53	OHD900000451038	1/4 - 1/2 Mile ENE
L54	OHD900000451037	1/4 - 1/2 Mile ENE
L55	OHD900000451036	1/4 - 1/2 Mile ENE
M56	OHD900000449281	1/4 - 1/2 Mile ESE
N57	OHD900000804455	1/4 - 1/2 Mile North
N58	OHD900000810341	1/4 - 1/2 Mile NNW
59	OHD900000428506	1/4 - 1/2 Mile NW
61	OHD900000449282	1/2 - 1 Mile ESE
P62	OHD900000841871	1/2 - 1 Mile South
N63	OHD900000452467	1/2 - 1 Mile NNW
O64	OHPWS8000004423	1/2 - 1 Mile East
P65	OHD900000817205	1/2 - 1 Mile South
P66	OHD900000817026	1/2 - 1 Mile South
Q67	OHD900000670251	1/2 - 1 Mile WNW
Q68	OHD900000690647	1/2 - 1 Mile WNW
P69	OHD900000661288	1/2 - 1 Mile South
R70	OHPWS8000004422	1/2 - 1 Mile East
71	OHD900000449283	1/2 - 1 Mile SE
S72	OHD900000428507	1/2 - 1 Mile NNW
73	OHD900000383573	1/2 - 1 Mile WNW
R74	OHPWS8000004421	1/2 - 1 Mile East

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

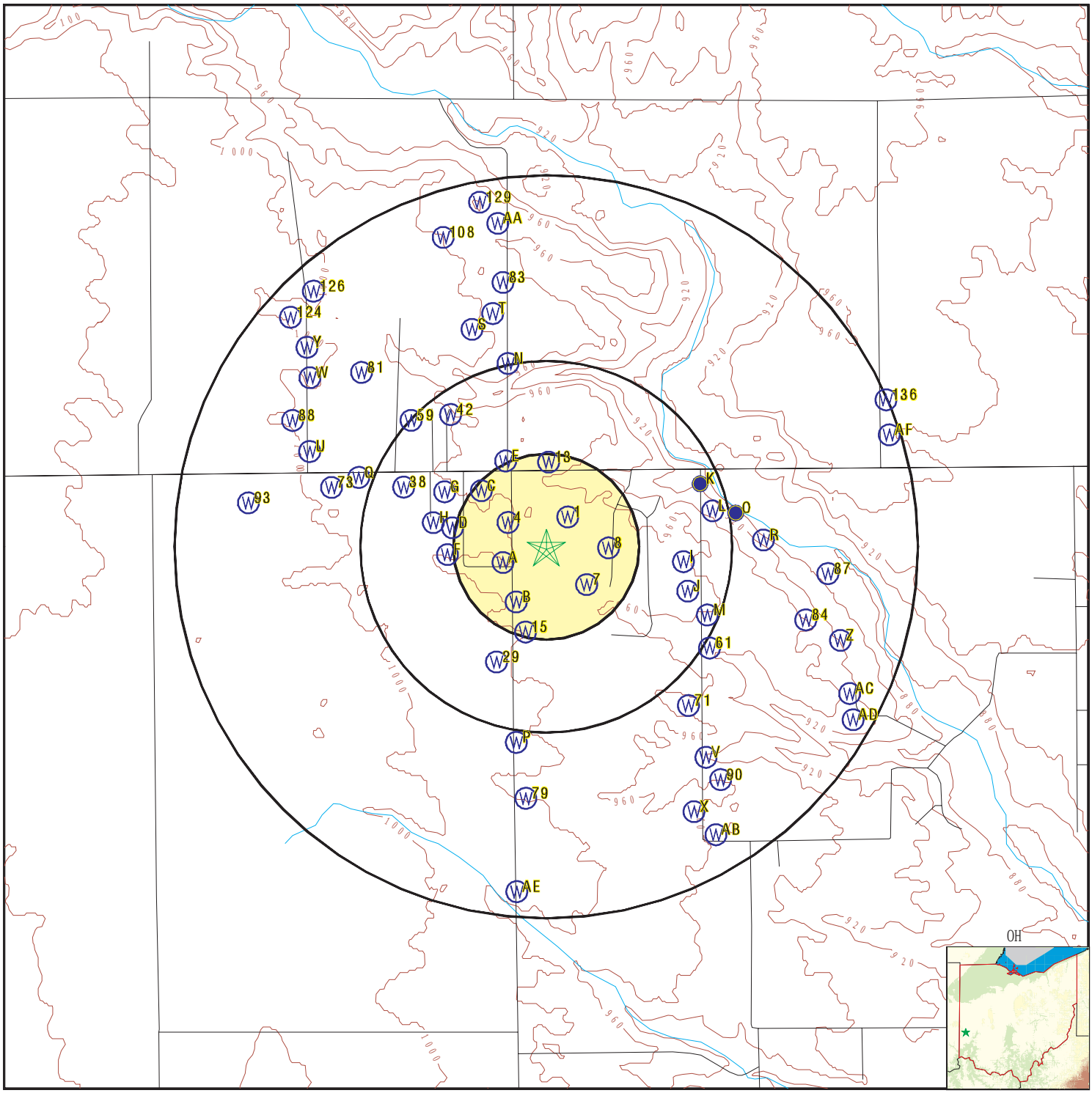
MAP ID	WELL ID	LOCATION FROM TP
T75	OHD900000808208	1/2 - 1 Mile NNW
S76	OHD900000428508	1/2 - 1 Mile NNW
U77	OHD900000428332	1/2 - 1 Mile WNW
T78	OHD900000428509	1/2 - 1 Mile NNW
79	OHD900000451031	1/2 - 1 Mile South
V80	OHD900000352973	1/2 - 1 Mile SE
81	OHD900000428504	1/2 - 1 Mile NW
U82	OHD900000322599	1/2 - 1 Mile WNW
83	OHD900000452466	1/2 - 1 Mile North
84	OHD900000438597	1/2 - 1 Mile ESE
V85	OHD900000609680	1/2 - 1 Mile SE
W86	OHD900000427881	1/2 - 1 Mile NW
87	OHPWS8000004424	1/2 - 1 Mile East
88	OHD900000427880	1/2 - 1 Mile WNW
X89	OHD900000747153	1/2 - 1 Mile SSE
90	OHD900000666341	1/2 - 1 Mile SE
X91	OHD900000818891	1/2 - 1 Mile SSE
W92	OHD900000597898	1/2 - 1 Mile NW
93	OHD900000451013	1/2 - 1 Mile West
X94	OHD900000426952	1/2 - 1 Mile SSE
X95	OHD900000427022	1/2 - 1 Mile SSE
Y96	OHD900000681749	1/2 - 1 Mile NW
X97	OHD900000427023	1/2 - 1 Mile SSE
X98	OHD900000823719	1/2 - 1 Mile SSE
Z99	OHD900000426986	1/2 - 1 Mile ESE
X100	OHD900000631887	1/2 - 1 Mile SSE
Z101	OHD900000452610	1/2 - 1 Mile ESE
Y102	OHD900000832543	1/2 - 1 Mile NW
X103	OHD900000356183	1/2 - 1 Mile SSE
Y104	OHD900000646845	1/2 - 1 Mile NW
AA105	OHD900000564900	1/2 - 1 Mile North
AA106	OHD900000845857	1/2 - 1 Mile North
AB107	OHD900000721245	1/2 - 1 Mile SSE
108	OHD900000770207	1/2 - 1 Mile NNW
AC109	OHD900000426985	1/2 - 1 Mile ESE
AB110	OHD900000426953	1/2 - 1 Mile SSE
AC111	OHD900000427198	1/2 - 1 Mile ESE
AB112	OHD900000509719	1/2 - 1 Mile SSE
AB113	OHD900000666142	1/2 - 1 Mile SSE
AB114	OHD900000666143	1/2 - 1 Mile SSE
AB115	OHD900000535381	1/2 - 1 Mile SSE
AA116	OHD900000646844	1/2 - 1 Mile North
AA117	OHD900000863395	1/2 - 1 Mile North
AC118	OHD900000449292	1/2 - 1 Mile ESE
AC119	OHD900000449284	1/2 - 1 Mile ESE
AB120	OHD900000535380	1/2 - 1 Mile SSE
AB121	OHD900000666019	1/2 - 1 Mile SSE
AD122	OHD900000809409	1/2 - 1 Mile ESE
AB123	OHD900000451944	1/2 - 1 Mile SSE
124	OHD900000427882	1/2 - 1 Mile NW
AE125	OHD900000451069	1/2 - 1 Mile South
126	OHD900000427883	1/2 - 1 Mile NW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AE127	OHD900000251521	1/2 - 1 Mile South
AE128	OHD900000637658	1/2 - 1 Mile South
129	OHD900000428510	1/2 - 1 Mile North
AC130	OHD900000449285	1/2 - 1 Mile ESE
AF131	OHD900000428522	1/2 - 1 Mile ENE
AF132	OHD900000634926	1/2 - 1 Mile ENE
AF133	OHD900000428521	1/2 - 1 Mile ENE
AD134	OHD900000268811	1/2 - 1 Mile ESE
AF135	OHD900000428520	1/2 - 1 Mile ENE
136	OHD900000428519	1/2 - 1 Mile ENE

PHYSICAL SETTING SOURCE MAP - 07728002.2r



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location
Oil, gas or related wells

N

SITE NAME:	ODOT Preble CO	CLIENT:	Resource International
ADDRESS:	234 Quaker Trace Rd West Alexandria OH 45381	CONTACT:	Kristy Engel-Shepard
		INQUIRY #:	07728002.2r
LAT/LONG:	39.741203 / 84.57426	DATE:	August 06, 2024 6:39 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

1
NE
0 - 1/8 Mile
Lower

OH WELLS **OHD900000470830**

Database:	Water Well Database	Well Log #:	966737
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	2996
Test Rate (gpm):	20	Draw Down:	20
Test Duration:	5	Surface Water Level (ft):	50
Date Measured:	20070402000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	20070403000000.000	Depth to Bedrock (ft):	99
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	918.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

A2
WSW
0 - 1/8 Mile
Higher

OH WELLS **OHD900000451931**

Database:	Water Well Database	Well Log #:	755407
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	10
Test Duration:	Not Reported	Surface Water Level (ft):	60
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	104
Completion Date:	19921229000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	923	Well Drilled By:	Not Reported
Comments:	Not Reported		

A3
WSW
0 - 1/8 Mile
Higher

OH WELLS **OHD900000410138**

Database:	Water Well Database	Well Log #:	998169
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	2882
Test Rate (gpm):	1	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	75
Date Measured:	20050916000000.000	Casing Height (ft):	1
Screen Length (ft):	3	Total Depth (ft):	88
Completion Date:	20050916000000.000	Depth to Bedrock (ft):	80

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	904.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

4
WNW **OH WELLS** **OHD900000268816**
0 - 1/8 Mile
Higher

Database:	Water Well Database	Well Log #:	859832
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	6	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	72
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	85
Completion Date:	19970721000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	907.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

A5
WSW **OH WELLS** **OHD900000712274**
1/8 - 1/4 Mile
Higher

Database:	Water Well Database	Well Log #:	1007120
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	3074
Test Rate (gpm):	1	Draw Down:	Not Reported
Test Duration:	5	Surface Water Level (ft):	55
Date Measured:	20080420000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	160
Completion Date:	20080420000000.000	Depth to Bedrock (ft):	87
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	923.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

B6
SSW **OH WELLS** **OHD900000338653**
1/8 - 1/4 Mile
Higher

Database:	Water Well Database	Well Log #:	949665
Well Type:	Water Well	Drill Type:	CABLE TOOL

Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE	Permit #:	2565
Test Rate (gpm):	12	Draw Down:	25
Test Duration:	2	Surface Water Level (ft):	65
Date Measured:	20030117000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	120
Completion Date:	20030117000000.000	Depth to Bedrock (ft):	90
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	909.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

7
SE **OH WELLS** **OHD900000853867**
1/8 - 1/4 Mile
Lower

Database:	Water Well Database	Well Log #:	130193
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	65
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	69
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Old		

8
East **OH WELLS** **OHD900000452617**
1/8 - 1/4 Mile
Lower

Database:	Water Well Database	Well Log #:	685859
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	71
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	79
Completion Date:	19880711000000.000	Depth to Bedrock (ft):	98
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	897.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

B9
SSW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD900000448938**

Database:	Water Well Database	Well Log #:	757265
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	0
Test Duration:	2	Surface Water Level (ft):	88
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	94
Completion Date:	19920811000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	891.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

B10
SSW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD900000596854**

Database:	Water Well Database	Well Log #:	957796
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	15
Test Duration:	1	Surface Water Level (ft):	63
Date Measured:	20030506000000.000	Casing Height (ft):	1
Screen Length (ft):	8	Total Depth (ft):	95
Completion Date:	20030506000000.000	Depth to Bedrock (ft):	83
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	915.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

C11
NW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD900000535383**

Database:	Water Well Database	Well Log #:	127807
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	20041022000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	60
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Well Condition: Fair Dry Hole		

D12
WNW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD900000451016**

Database:	Water Well Database	Well Log #:	109493
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	78
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	110
Completion Date:	19540122000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	904	Well Drilled By:	Not Reported
Comments:	Not Reported		

13
North
1/8 - 1/4 Mile
Lower

OH WELLS **OHD900000428515**

Database:	Water Well Database	Well Log #:	521528
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	20
Test Duration:	2	Surface Water Level (ft):	42
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	106
Completion Date:	19780330000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	923.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

C14
NW
1/8 - 1/4 Mile
Lower

OH WELLS **OHD900000483211**

Database:	Water Well Database	Well Log #:	54055
Well Type:	Water Well	Drill Type:	Not Reported

Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL AND CLAY	Permit #:	Not Reported
Test Rate (gpm):	6	Draw Down:	2
Test Duration:	2	Surface Water Level (ft):	27
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	72
Completion Date:	19500526000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	945.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

15
SSW
1/8 - 1/4 Mile
Higher

OH WELLS **OHD900000451030**

Database:	Water Well Database	Well Log #:	489490
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	LIMESTONE	Permit #:	Not Reported
Test Rate (gpm):	3	Draw Down:	51
Test Duration:	2	Surface Water Level (ft):	25
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	76
Completion Date:	19761104000000.000	Depth to Bedrock (ft):	57
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	954.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

C16
NW
1/8 - 1/4 Mile
Lower

OH WELLS **OHD900000451021**

Database:	Water Well Database	Well Log #:	96925
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	52
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	106
Completion Date:	19521101000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	920.4	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E17
NNW
1/8 - 1/4 Mile
Lower

OH WELLS **OHD900000428514**

Database:	Water Well Database	Well Log #:	506919
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	70
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	103
Completion Date:	19770210000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	901.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

C18
NW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451015**

Database:	Water Well Database	Well Log #:	135497
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	12
Test Duration:	1	Surface Water Level (ft):	50
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	80
Completion Date:	19590620000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	928.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

F19
West
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451020**

Database:	Water Well Database	Well Log #:	510884
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	28
Completion Date:	19830609000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

F20
West
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451019**

Database:	Water Well Database	Well Log #:	621322
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	3	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	6.6
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	28
Completion Date:	19830521000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	975.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

E21
NNW
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000640296**

Database:	Water Well Database	Well Log #:	982153
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	ROCK & SHALE	Permit #:	2773
Test Rate (gpm):	10	Draw Down:	54
Test Duration:	1	Surface Water Level (ft):	60
Date Measured:	20041021000000.000	Casing Height (ft):	1
Screen Length (ft):	Not Reported	Total Depth (ft):	150
Completion Date:	20041021000000.000	Depth to Bedrock (ft):	143
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	913.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

G22
WNW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000528593**

Database:	Water Well Database	Well Log #:	1007121
Well Type:	Water Well	Drill Type:	CABLE TOOL

Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	3090
Test Rate (gpm):	20	Draw Down:	15
Test Duration:	3	Surface Water Level (ft):	67
Date Measured:	20080626000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	115
Completion Date:	20080626000000.000	Depth to Bedrock (ft):	100
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	914	Well Drilled By:	Not Reported
Comments:	Not Reported		

D23
West
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451018**

Database:	Water Well Database	Well Log #:	603717
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	6
Test Duration:	2	Surface Water Level (ft):	67
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	87
Completion Date:	19820919000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	916.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

D24
WNW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451017**

Database:	Water Well Database	Well Log #:	619490
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	80
Test Duration:	2	Surface Water Level (ft):	70
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	106
Completion Date:	19840418000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	913.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

H25
WNW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000835065**

Database:	Water Well Database	Well Log #:	314428
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	3455
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	20161130000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	87
Completion Date:	20161202000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Inadequate		

H26
West
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000831587**

Database:	Water Well Database	Well Log #:	2060550
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	3455
Test Rate (gpm):	30	Draw Down:	11
Test Duration:	1	Surface Water Level (ft):	70
Date Measured:	20161130000000.000	Casing Height (ft):	1.6
Screen Length (ft):	3	Total Depth (ft):	95
Completion Date:	20161130000000.000	Depth to Bedrock (ft):	104
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	SUBMERSIBLE
Pump Capacity (gpm):	10	Pump Installed By:	WILEY WELL DRILLING, INC.
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Clear		

G27
WNW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451014**

Database:	Water Well Database	Well Log #:	230201
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	10
Test Duration:	Not Reported	Surface Water Level (ft):	60
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	112
Completion Date:	19590422000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	926.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

G28
WNW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000645729**

Database:	Water Well Database	Well Log #:	322014
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	85
Completion Date:	20181102000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

29
SSW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000451029**

Database:	Water Well Database	Well Log #:	609105
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	6	Draw Down:	55
Test Duration:	3	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	60
Completion Date:	19820529000000.000	Depth to Bedrock (ft):	30
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

I30
East
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000803912**

Database:	Water Well Database	Well Log #:	1012691
Well Type:	Water Well	Drill Type:	CABLE TOOL

Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SANDSTONE	Permit #:	3295
Test Rate (gpm):	20	Draw Down:	5
Test Duration:	1	Surface Water Level (ft):	96
Date Measured:	20120906000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	145
Completion Date:	20120901000000.000	Depth to Bedrock (ft):	99
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	866.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

I31
East
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000451039**

Database:	Water Well Database	Well Log #:	348475
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	20
Test Duration:	2	Surface Water Level (ft):	40
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	19670815000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	919.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

I32
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000451040**

Database:	Water Well Database	Well Log #:	472779
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	ROCK	Permit #:	Not Reported
Test Rate (gpm):	6	Draw Down:	12
Test Duration:	1	Surface Water Level (ft):	85
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	110
Completion Date:	19740802000000.000	Depth to Bedrock (ft):	94
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	877	Well Drilled By:	Not Reported
Comments:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database | EDR ID Number

J33
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000449276**

Database:	Water Well Database	Well Log #:	421779
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	2
Test Duration:	2	Surface Water Level (ft):	75
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	94
Completion Date:	19720619000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	887.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

J34
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000449277**

Database:	Water Well Database	Well Log #:	447160
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	5	Draw Down:	15
Test Duration:	2	Surface Water Level (ft):	82
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	97
Completion Date:	19730617000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	881.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

J35
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000406837**

Database:	Water Well Database	Well Log #:	2000839
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	2910
Test Rate (gpm):	12	Draw Down:	3
Test Duration:	2	Surface Water Level (ft):	87
Date Measured:	20060109000000.000	Casing Height (ft):	2
Screen Length (ft):	4	Total Depth (ft):	142
Completion Date:	20060109000000.000	Depth to Bedrock (ft):	95

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	874.8	Well Drilled By:	Not Reported
Comments:	Good		

I36
East **OH WELLS** **OHD900000799699**
1/4 - 1/2 Mile
Lower

Database:	Water Well Database	Well Log #:	123888
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	99
Completion Date:	20120907000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

K37
ENE **OH WELLS** **OHD900000451032**
1/4 - 1/2 Mile
Lower

Database:	Water Well Database	Well Log #:	243430
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	30	Draw Down:	10
Test Duration:	Not Reported	Surface Water Level (ft):	35
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	75
Completion Date:	19600901000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	877.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

38
WNW **OH WELLS** **OHD900000390639**
1/4 - 1/2 Mile
Higher

Database:	Water Well Database	Well Log #:	54052
Well Type:	Water Well	Drill Type:	Not Reported

Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	42
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	97
Completion Date:	19500510000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	942.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

L39
East
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000647923**

Database:	Water Well Database	Well Log #:	968673
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	16
Test Duration:	1	Surface Water Level (ft):	84
Date Measured:	20040115000000.000	Casing Height (ft):	2
Screen Length (ft):	4	Total Depth (ft):	100
Completion Date:	20040115000000.000	Depth to Bedrock (ft):	100
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	863.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

L40
East
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000700242**

Database:	Water Well Database	Well Log #:	959874
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	4671
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	43
Completion Date:	20031211000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

L41
East
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000637666**

Database:	Water Well Database	Well Log #:	881830
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	2037
Test Rate (gpm):	15	Draw Down:	20
Test Duration:	Not Reported	Surface Water Level (ft):	88
Date Measured:	19981021000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	115
Completion Date:	19981021000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	851.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

42
NW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000428505**

Database:	Water Well Database	Well Log #:	609685
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	75	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	82
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	165
Completion Date:	19811113000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	899.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

J43
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000453237**

Database:	Water Well Database	Well Log #:	650615
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND CLAY	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	80
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	19841030000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	876.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

K44
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHWT40000003154**

Database:	Water Treatment Facilities	PWS ID:	OH6801612
WTP Name:	Eaton Pws Black Plant	Status:	Active
System Name:	Eaton Public Water System	System #:	5681
System Status:	Active	PWS System Type:	Community
Source:	Groundwater	Population Served:	8400
Facility/Plant ID:	6857530	Flow Rate:	2.4
Flow Rate Units:	MGL		

K45
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHPWS8000004420**

Database:	Public Water Systems Data	PWS ID:	OH6801612
Well Number:	17264	Well Name:	Eaton, City Of-Black Plt Well 0b01
Public System Name:	Eaton Public Water System	ODNR Well Log #:	BLACK WTP #1
Well Availability:	Permanent	Activation Date:	2000-02-08T00:00:00.000Z
Well Status:	Active	System Status:	Active
Last Well Update:	2017-02-15T15:17:28.000Z	Last System Update:	2011-10-12T08:52:19.000Z

K46
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHDM30000035094**

Database:	Monitoring Water Wells Listing		
Well Log #:	2000914	Well Type:	Water Well
Drill Type:	ROTARY	Test Type:	Pumping
Well Use:	MONITOR	Aquifer Type:	SAND AND GRAVEL
Permit #:	Not Reported	Test Rate (gpm):	30
Draw Down:	1.6	Test Duration:	1
Surface Water Level (ft):	34.9	Date Measured:	20051108000000.000
Casing Height (ft):	2	Screen Length (ft):	5
Total Depth (ft):	62	Completion Date:	20051108000000.000
Depth to Bedrock (ft):	Not Reported	Drill Year:	Not Reported
Well Seal Report #:	Not Reported	Screen Diameter (in):	6
Screen Type:	CONTINOUS WIRE WOUND	Screen Material:	STAINLESS STEEL
Pump Type:	Not Reported	Pump Capacity (gpm):	Not Reported
Pump Installed By:	Not Reported	Water Level Elev (ft):	876.6
Well Drilled By:	Not Reported	Comments:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

M47
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000637656**

Database:	Water Well Database	Well Log #:	914311
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	2318
Test Rate (gpm):	2	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	90
Date Measured:	20000724000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	105
Completion Date:	20000724000000.000	Depth to Bedrock (ft):	93
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	869	Well Drilled By:	Not Reported
Comments:	Not Reported		

K48
ENE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000953347**

Organization ID:	USGS-OH	Organization Name:	USGS Ohio Water Science Center
Monitor Location:	PR-2A	Type:	Well
Description:	Well presently operated by ODNR		
HUC:	05080002	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Outwash	Aquifer Type:	Unconfined single aquifer
Construction Date:	20051108	Well Depth:	62
Well Depth Units:	ft	Well Hole Depth:	65
Well Hole Depth Units:	ft		

K49
ENE
1/4 - 1/2 Mile
Lower

FED USGS **USGS40000953346**

Organization ID:	USGS-OH	Organization Name:	USGS Ohio Water Science Center
Monitor Location:	PR-2	Type:	Well
Description:	Well presently operated by ODNR		
HUC:	05080002	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Sand and gravel aquifers (glaciated regions)		
Formation Type:	Outwash	Aquifer Type:	Confined single aquifer
Construction Date:	Not Reported	Well Depth:	78
Well Depth Units:	ft	Well Hole Depth:	78.5
Well Hole Depth Units:	ft		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

L50
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000451035**

Database:	Water Well Database	Well Log #:	366591
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	300	Draw Down:	16.4
Test Duration:	8	Surface Water Level (ft):	26.6
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	72
Completion Date:	19690814000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	898.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

L51
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000451034**

Database:	Water Well Database	Well Log #:	366592
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL AND CLAY	Permit #:	Not Reported
Test Rate (gpm):	450	Draw Down:	4.1
Test Duration:	8	Surface Water Level (ft):	25
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	70
Completion Date:	19690930000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	899.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

L52
ENE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000451033**

Database:	Water Well Database	Well Log #:	366590
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	500	Draw Down:	8.6
Test Duration:	8	Surface Water Level (ft):	14
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	62
Completion Date:	19690811000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	910.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

L53
ENE **OH WELLS** **OHD900000451038**
1/4 - 1/2 Mile
Lower

Database:	Water Well Database	Well Log #:	374153
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	7.8
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	66
Completion Date:	19671204000000.000	Depth to Bedrock (ft):	61
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	916.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

L54
ENE **OH WELLS** **OHD900000451037**
1/4 - 1/2 Mile
Lower

Database:	Water Well Database	Well Log #:	374151
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GLACIAL TILL	Permit #:	Not Reported
Test Rate (gpm):	294	Draw Down:	8.9
Test Duration:	9	Surface Water Level (ft):	27.2
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	91
Completion Date:	19671204000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	897.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

L55
ENE **OH WELLS** **OHD900000451036**
1/4 - 1/2 Mile
Lower

Database:	Water Well Database	Well Log #:	374152
Well Type:	Water Well	Drill Type:	Not Reported

Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	LIMESTONE	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	6
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	101
Completion Date:	19671204000000.000	Depth to Bedrock (ft):	96
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	918.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

M56
ESE
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000449281**

Database:	Water Well Database	Well Log #:	439795
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	4	Draw Down:	20
Test Duration:	2.5	Surface Water Level (ft):	80
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	105
Completion Date:	19710201000000.000	Depth to Bedrock (ft):	94
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	877.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

N57
North
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000804455**

Database:	Water Well Database	Well Log #:	300094
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	3286
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	42
Completion Date:	20120808000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

N58
NNW
1/4 - 1/2 Mile
Lower

OH WELLS **OHD900000810341**

Database:	Water Well Database	Well Log #:	2039005
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	3286
Test Rate (gpm):	65	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	81
Date Measured:	20120807000000.000	Casing Height (ft):	1.6
Screen Length (ft):	3	Total Depth (ft):	150
Completion Date:	20120807000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	CONTINOUS WIRE WOUND
Screen Material:	PVC	Pump Type:	SUBMERSIBLE
Pump Capacity (gpm):	10	Pump Installed By:	Not Reported
Water Level Elev (ft):	892	Well Drilled By:	Not Reported
Comments:	Clear		

59
NW
1/4 - 1/2 Mile
Higher

OH WELLS **OHD900000428506**

Database:	Water Well Database	Well Log #:	407517
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	10
Test Duration:	4	Surface Water Level (ft):	65
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	165
Completion Date:	19720707000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	920.2	Well Drilled By:	Not Reported
Comments:	Not Reported		

O60
ENE
1/2 - 1 Mile
Lower

FRDS PWS **OH6800422**

Epa region:	05	State:	OH
Pwsid:	OH6800422	Pwsname:	EATON, CITY OF-BLACK PLT.
Cityserved:	Not Reported	Stateserved:	OH
Zipserved:	Not Reported	Fipscounty:	39135
Status:	Closed	Retpopsrvd:	3975
Pwssvcconn:	1597	Psource longname:	Groundwater
Pwstype:	CWS	Owner:	Local_Govt
Contact:	Not Reported	Contactorgname:	Not Reported
Contactphone:	Not Reported	Contactaddress1:	JOHN HORNBROOK, SERVICE DIR.

Contactaddress2:	328 NORTH MAPLE STREET	Contactcity:	EATON
Contactstate:	OH	Contactzip:	45320
Pwsactivitycode:	I		
Pwsid:	OH6800422	Facid:	5
Facname:	Not Reported	Factype:	Treatment_plant
Facactivitycode:	I	Trtobjective:	particulate removal
Trtprocess:	filtered	Factypecode:	TP
PWS ID:	OH6800422	PWS name:	EATON, CITY OF-BLACK PLT.
Address:	328 NORTH MAPLE STREET	Care of:	JOHN HORNBROOK, SERVICE DIR.
City:	EATON	State:	OH
Zip:	45320	Owner:	EATON, CITY OF-BLACK PLT.
Source code:	Ground water	Population:	3975
PWS ID:	OH6800422	PWS type:	Not Reported
PWS name:	Not Reported	PWS address:	Not Reported
PWS city:	Not Reported	PWS state:	Not Reported
PWS zip:	Not Reported	PWS ID:	OH6800422
Activity status:	Active	Date system activated:	Not Reported
Date system deactivated:	Not Reported	Retail population:	00003975
System name:	EATON, CITY OF-BLACK PLT.	System address:	JOHN HORNBROOK, SERVICE DIR.
System address:	328 NORTH MAPLE STREET	System city:	EATON
System state:	OH	System zip:	45320
Population served:	3,301 - 5,000 Persons	Treatment:	Treated
Latitude:	394438	Longitude:	0843812
State:	OH	Latitude degrees:	39
Latitude minutes:	44	Latitude seconds:	34.0000
Longitude degrees:	84	Longitude minutes:	33
Longitude seconds:	54.0000		

61
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000449282**

Database:	Water Well Database	Well Log #:	489471
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	LIMESTONE	Permit #:	Not Reported
Test Rate (gpm):	14	Draw Down:	6
Test Duration:	2	Surface Water Level (ft):	54
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	19760608000000.000	Depth to Bedrock (ft):	82
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	891.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

P62
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000841871**

Database:	Water Well Database	Well Log #:	2074009
Well Type:	Water Well	Drill Type:	MUD ROTARY
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	3571
Test Rate (gpm):	2	Draw Down:	90
Test Duration:	1	Surface Water Level (ft):	6.5
Date Measured:	20190529000000.000	Casing Height (ft):	2
Screen Length (ft):	5	Total Depth (ft):	100
Completion Date:	20190529000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	8	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	SUBMERSIBLE
Pump Capacity (gpm):	10	Pump Installed By:	L.M.KETTLER,INC
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

N63
NNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000452467**

Database:	Water Well Database	Well Log #:	667923
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	35	Draw Down:	30
Test Duration:	1	Surface Water Level (ft):	83
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	165
Completion Date:	19870611000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	892.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

O64
East
1/2 - 1 Mile
Lower

OH WELLS **OHPWS8000004423**

Database:	Public Water Systems Data	PWS ID:	OH6801612
Well Number:	17265	Well Name:	Eaton, City Of-Black Plt Well 0b02
Public System Name:	Eaton Public Water System	ODNR Well Log #:	BLACK WTP #2
Well Availability:	Permanent	Activation Date:	2000-02-08T00:00:00.000Z
Well Status:	Active	System Status:	Active
Last Well Update:	2017-02-15T15:20:40.000Z	Last System Update:	2011-10-12T08:52:19.000Z

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

P65
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000817205**

Database:	Water Well Database	Well Log #:	1019384
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	3439
Test Rate (gpm):	6	Draw Down:	70
Test Duration:	120	Surface Water Level (ft):	30
Date Measured:	20160806000000.000	Casing Height (ft):	1
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	20160805000000.000	Depth to Bedrock (ft):	55
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	SUBMERSIBLE
Pump Capacity (gpm):	10	Pump Installed By:	RIDDLE WELL DRILLING
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Clear		

P66
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000817026**

Database:	Water Well Database	Well Log #:	210122
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	ABANDONED
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	30
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	45
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

Q67
WNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000670251**

Database:	Water Well Database	Well Log #:	127436
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	82
Date Measured:	20011015000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	90
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Low Production, Abandoned		

Q68
WNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000690647**

Database:	Water Well Database	Well Log #:	933486
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	2439
Test Rate (gpm):	40	Draw Down:	25
Test Duration:	1	Surface Water Level (ft):	78
Date Measured:	20011004000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	10	Total Depth (ft):	121
Completion Date:	20011004000000.000	Depth to Bedrock (ft):	20
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	915.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

P69
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000661288**

Database:	Water Well Database	Well Log #:	896558
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	ROCK	Permit #:	Not Reported
Test Rate (gpm):	4	Draw Down:	65
Test Duration:	1	Surface Water Level (ft):	17
Date Measured:	19991012000000.000	Casing Height (ft):	1
Screen Length (ft):	Not Reported	Total Depth (ft):	65
Completion Date:	19991012000000.000	Depth to Bedrock (ft):	46
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

R70
East
1/2 - 1 Mile
Lower

OH WELLS **OHPWS8000004422**

Database:	Public Water Systems Data	PWS ID:	OH6801612
Well Number:	17266	Well Name:	Eaton, City Of-Black Plt Well 0b03

Public System Name:	Eaton Public Water System	ODNR Well Log #:	BLACK WTP #3
Well Availability:	Permanent	Activation Date:	2000-02-08T00:00:00.000Z
Well Status:	Active	System Status:	Active
Last Well Update:	2017-02-15T15:23:27.000Z	Last System Update:	2011-10-12T08:52:19.000Z

71
SE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000449283**

Database:	Water Well Database	Well Log #:	177688
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	8	Draw Down:	4
Test Duration:	1	Surface Water Level (ft):	50
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	67
Completion Date:	19560917000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	909.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

S72
NNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000428507**

Database:	Water Well Database	Well Log #:	528624
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	20
Test Duration:	2	Surface Water Level (ft):	61
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	95
Completion Date:	19790629000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	922.2	Well Drilled By:	Not Reported
Comments:	Not Reported		

73
WNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000383573**

Database:	Water Well Database	Well Log #:	54054
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL AND CLAY	Permit #:	Not Reported

Test Rate (gpm):	10	Draw Down:	4
Test Duration:	1	Surface Water Level (ft):	17
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	94
Completion Date:	19500512000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	978.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

R74
East
1/2 - 1 Mile
Lower

OH WELLS **OHPWS8000004421**

Database:	Public Water Systems Data	PWS ID:	OH6801612
Well Number:	17267	Well Name:	Eaton, City Of-Black Plt Well 0b04
Public System Name:	Eaton Public Water System	ODNR Well Log #:	BLACK WTP #4
Well Availability:	Permanent	Activation Date:	2000-02-08T00:00:00.000Z
Well Status:	Active	System Status:	Active
Last Well Update:	2017-02-15T15:26:25.000Z	Last System Update:	2011-10-12T08:52:19.000Z

T75
NNW
1/2 - 1 Mile
Lower

OH WELLS **OHD900000808208**

Database:	Water Well Database	Well Log #:	2034785
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	65	Draw Down:	20
Test Duration:	1	Surface Water Level (ft):	83
Date Measured:	20110930000000.000	Casing Height (ft):	1.6
Screen Length (ft):	5	Total Depth (ft):	136
Completion Date:	20110930000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	893.8	Well Drilled By:	Not Reported
Comments:	Clear		

S76
NNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000428508**

Database:	Water Well Database	Well Log #:	421751
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	4
Test Duration:	2	Surface Water Level (ft):	39

Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	62
Completion Date:	19710513000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	944.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

U77
WNW **OH WELLS** **OHD900000428332**
1/2 - 1 Mile
Higher

Database:	Water Well Database	Well Log #:	135468
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	15	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	70
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	114
Completion Date:	19540917000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	924.2	Well Drilled By:	Not Reported
Comments:	Not Reported		

T78
NNW **OH WELLS** **OHD900000428509**
1/2 - 1 Mile
Higher

Database:	Water Well Database	Well Log #:	320910
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	70
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	137
Completion Date:	19641019000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	908.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation

Database	EDR ID Number
OH WELLS	OHD900000451031

79
South
1/2 - 1 Mile
Higher

Database:	Water Well Database	Well Log #:	304005
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	2	Surface Water Level (ft):	10
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	101
Completion Date:	19640229000000.000	Depth to Bedrock (ft):	9
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	970	Well Drilled By:	Not Reported
Comments:	Not Reported		

V80
SE
1/2 - 1 Mile
Lower

Database	EDR ID Number
OH WELLS	OHD900000352973

Database:	Water Well Database	Well Log #:	931021
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	2540
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	5	Surface Water Level (ft):	55
Date Measured:	20021015000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	100
Completion Date:	20021015000000.000	Depth to Bedrock (ft):	71
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	890.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

81
NW
1/2 - 1 Mile
Higher

Database	EDR ID Number
OH WELLS	OHD900000428504

Database:	Water Well Database	Well Log #:	521539
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	3	Draw Down:	Not Reported
Test Duration:	2	Surface Water Level (ft):	20
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	70
Completion Date:	19780512000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	973.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

U82
WNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000322599**

Database:	Water Well Database	Well Log #:	946110
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	2502
Test Rate (gpm):	11	Draw Down:	30
Test Duration:	1	Surface Water Level (ft):	82
Date Measured:	20020809000000.000	Casing Height (ft):	2
Screen Length (ft):	18	Total Depth (ft):	183
Completion Date:	20020809000000.000	Depth to Bedrock (ft):	6
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	916.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

83
North
1/2 - 1 Mile
Lower

OH WELLS **OHD900000452466**

Database:	Water Well Database	Well Log #:	634224
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	60	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	50
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	160
Completion Date:	19860620000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	922.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

84
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000438597**

Database:	Water Well Database	Well Log #:	966750
Well Type:	Water Well	Drill Type:	CABLE TOOL

Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	2956
Test Rate (gpm):	20	Draw Down:	5
Test Duration:	4	Surface Water Level (ft):	20
Date Measured:	20060810000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	52
Completion Date:	20060810000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	920.4	Well Drilled By:	Not Reported
Comments:	Not Reported		

V85
SE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000609680**

Database:	Water Well Database	Well Log #:	957661
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	ROCK	Permit #:	2630
Test Rate (gpm):	10	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	40
Date Measured:	20030922000000.000	Casing Height (ft):	1
Screen Length (ft):	Not Reported	Total Depth (ft):	80
Completion Date:	20030922000000.000	Depth to Bedrock (ft):	62
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	908	Well Drilled By:	Not Reported
Comments:	Not Reported		

W86
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000427881**

Database:	Water Well Database	Well Log #:	135486
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	60
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	104
Completion Date:	19580101000000.000	Depth to Bedrock (ft):	19
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	938.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

87
East
1/2 - 1 Mile
Lower

OH WELLS **OHPWS8000004424**

Database:	Public Water Systems Data	PWS ID:	OH6801612
Well Number:	17256	Well Name:	Eaton Pws Black Plant Well 0005
Public System Name:	Eaton Public Water System	ODNR Well Log #:	BLACK WTP #5
Well Availability:	Permanent	Activation Date:	2001-05-03T00:00:00.000Z
Well Status:	Active	System Status:	Active
Last Well Update:	2017-02-15T15:31:35.000Z	Last System Update:	2011-10-12T08:52:19.000Z

88
WNW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000427880**

Database:	Water Well Database	Well Log #:	407531
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	55
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	168
Completion Date:	19720620000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	941.2	Well Drilled By:	Not Reported
Comments:	Not Reported		

X89
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000747153**

Database:	Water Well Database	Well Log #:	2021374
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	3116
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	0	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	90
Completion Date:	20090306000000.000	Depth to Bedrock (ft):	74
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

Database	EDR ID Number
OH WELLS	OHD900000666341

90
SE
1/2 - 1 Mile
Lower

Database:	Water Well Database	Well Log #:	984553
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	27820
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	1	Surface Water Level (ft):	54
Date Measured:	20041006000000.000	Casing Height (ft):	1
Screen Length (ft):	3	Total Depth (ft):	90
Completion Date:	20041006000000.000	Depth to Bedrock (ft):	68
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	904.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

X91
SSE
1/2 - 1 Mile
Lower

OH WELLS OHD900000818891

Database:	Water Well Database	Well Log #:	2052972
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL AND CLAY	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	0
Test Duration:	1	Surface Water Level (ft):	44
Date Measured:	20150728000000.000	Casing Height (ft):	1.6
Screen Length (ft):	3	Total Depth (ft):	46
Completion Date:	20150728000000.000	Depth to Bedrock (ft):	46
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	CONTINOUS WIRE WOUND
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	916.7	Well Drilled By:	Not Reported
Comments:	Well Only Made 1/4 - 1/2 Gallon Per Minute		

W92
NW
1/2 - 1 Mile
Higher

OH WELLS OHD900000597898

Database:	Water Well Database	Well Log #:	968614
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	2582
Test Rate (gpm):	65	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	80
Date Measured:	20031022000000.000	Casing Height (ft):	2
Screen Length (ft):	3	Total Depth (ft):	173
Completion Date:	20031022000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	919.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

93
West
1/2 - 1 Mile
Higher

OH WELLS **OHD900000451013**

Database:	Water Well Database	Well Log #:	230245
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	13	Draw Down:	0
Test Duration:	Not Reported	Surface Water Level (ft):	90
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	126
Completion Date:	19640131000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	921.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

X94
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000426952**

Database:	Water Well Database	Well Log #:	724207
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHELL	Permit #:	Not Reported
Test Rate (gpm):	11	Draw Down:	15
Test Duration:	1	Surface Water Level (ft):	11
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	69
Completion Date:	19930301000000.000	Depth to Bedrock (ft):	59
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	947.2	Well Drilled By:	Not Reported
Comments:	Not Reported		

X95
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000427022**

Database:	Water Well Database	Well Log #:	772756
Well Type:	Water Well	Drill Type:	CABLE TOOL

Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	9
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	81
Completion Date:	19940214000000.000	Depth to Bedrock (ft):	47
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	949.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

Y96
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000681749**

Database:	Water Well Database	Well Log #:	976925
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	2721
Test Rate (gpm):	50	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	107
Date Measured:	20040513000000.000	Casing Height (ft):	2
Screen Length (ft):	3	Total Depth (ft):	204
Completion Date:	20040513000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	892.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

X97
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000427023**

Database:	Water Well Database	Well Log #:	792340
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	5	Draw Down:	Not Reported
Test Duration:	3	Surface Water Level (ft):	23
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	95
Completion Date:	19940613000000.000	Depth to Bedrock (ft):	37
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	935	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

X98
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000823719**

Database:	Water Well Database	Well Log #:	2053469
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	3408
Test Rate (gpm):	Not Reported	Draw Down:	0
Test Duration:	1	Surface Water Level (ft):	0
Date Measured:	20150812000000.000	Casing Height (ft):	1.6
Screen Length (ft):	57	Total Depth (ft):	100
Completion Date:	20150812000000.000	Depth to Bedrock (ft):	100
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	961.4	Well Drilled By:	Not Reported
Comments:	Well Made 1/4 Gpm And Cloudy		

Z99
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000426986**

Database:	Water Well Database	Well Log #:	718940
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	0
Test Duration:	0	Surface Water Level (ft):	0
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	95
Completion Date:	19901027000000.000	Depth to Bedrock (ft):	87
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	934	Well Drilled By:	Not Reported
Comments:	Not Reported		

X100
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000631887**

Database:	Water Well Database	Well Log #:	2070042
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	3540
Test Rate (gpm):	.5	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	50
Date Measured:	20180917000000.000	Casing Height (ft):	1.6
Screen Length (ft):	3	Total Depth (ft):	66
Completion Date:	20180917000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	CONTINOUS WIRE WOUND
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Cloudy Well Made Between 1/4 - 1/2 Gallon Per Minute Installed 2 Screens .020 Slot 42'-45' And .050 Slot 46'-66'		

Z101
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000452610**

Database:	Water Well Database	Well Log #:	651062
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	15	Draw Down:	50
Test Duration:	4	Surface Water Level (ft):	50
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	107
Completion Date:	19851214000000.000	Depth to Bedrock (ft):	82
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	865.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

Y102
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000832543**

Database:	Water Well Database	Well Log #:	638691
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	6	Draw Down:	25
Test Duration:	4	Surface Water Level (ft):	45
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	126
Completion Date:	19871102000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	958.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

X103
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000356183**

Database:	Water Well Database	Well Log #:	931018
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	2523
Test Rate (gpm):	20	Draw Down:	5
Test Duration:	6	Surface Water Level (ft):	55
Date Measured:	20020916000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	125
Completion Date:	20020916000000.000	Depth to Bedrock (ft):	59
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	903.4	Well Drilled By:	Not Reported
Comments:	Well Has 120’ Sch 40 Pvc Liner In Well To Hold Back Soft Cavey Walls.		

Y104
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000646845**

Database:	Water Well Database	Well Log #:	976933
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	ROCK & CLAY	Permit #:	2664
Test Rate (gpm):	40	Draw Down:	25
Test Duration:	1	Surface Water Level (ft):	111
Date Measured:	20040505000000.000	Casing Height (ft):	1
Screen Length (ft):	3	Total Depth (ft):	204
Completion Date:	20040505000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

AA105
North
1/2 - 1 Mile
Lower

OH WELLS **OHD900000564900**

Database:	Water Well Database	Well Log #:	331272
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	65
Date Measured:	20210115000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	125
Completion Date:	20210115000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	New Well		

AA106
North
1/2 - 1 Mile
Lower

OH WELLS **OHD900000845857**

Database:	Water Well Database	Well Log #:	2084172
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Pumping	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	3663
Test Rate (gpm):	25	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	54
Date Measured:	20210112000000.000	Casing Height (ft):	1.4
Screen Length (ft):	2	Total Depth (ft):	128
Completion Date:	20210112000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB107
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000721245**

Database:	Water Well Database	Well Log #:	2020896
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND/GRAVEL/CLAY	Permit #:	3117
Test Rate (gpm):	.5	Draw Down:	85
Test Duration:	3	Surface Water Level (ft):	13
Date Measured:	20090122000000.000	Casing Height (ft):	1.5
Screen Length (ft):	1	Total Depth (ft):	100
Completion Date:	20090122000000.000	Depth to Bedrock (ft):	62
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	6.25	Screen Type:	PERFORATED (DRILLED)
Screen Material:	GALVANIZED STEEL	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	943.3	Well Drilled By:	Not Reported
Comments:	Very Little Formation,Water Cloudy But Clearing Presence Of Grout At Undetermined Depth		Grout Visible @4 Feet

Map ID
Direction
Distance
Elevation

Database	EDR ID Number
OH WELLS	OHD900000770207

108
NNW
1/2 - 1 Mile
Higher

Database:	Water Well Database	Well Log #:	2022099
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	40	Draw Down:	30
Test Duration:	1	Surface Water Level (ft):	84
Date Measured:	20090506000000.000	Casing Height (ft):	1.6
Screen Length (ft):	2	Total Depth (ft):	173
Completion Date:	20090506000000.000	Depth to Bedrock (ft):	186
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	CONTINOUS WIRE WOUND
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	892.8	Well Drilled By:	Not Reported
Comments:	Clear - Shade Cloudy		

AC109
ESE
1/2 - 1 Mile
Lower

Database	EDR ID Number
OH WELLS	OHD900000426985

Database:	Water Well Database	Well Log #:	634225
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	40	Draw Down:	0
Test Duration:	1	Surface Water Level (ft):	27
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	50
Completion Date:	19860620000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	907.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB110
SSE
1/2 - 1 Mile
Lower

Database	EDR ID Number
OH WELLS	OHD900000426953

Database:	Water Well Database	Well Log #:	792363
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	Not Reported
Test Rate (gpm):	2	Draw Down:	Not Reported
Test Duration:	4	Surface Water Level (ft):	20
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	130
Completion Date:	19940830000000.000	Depth to Bedrock (ft):	34

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	939.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

AC111
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000427198**

Database:	Water Well Database	Well Log #:	533903
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	4
Test Duration:	1	Surface Water Level (ft):	21
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	40
Completion Date:	19780531000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	915.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB112
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000509719**

Database:	Water Well Database	Well Log #:	852771
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	40
Test Duration:	1	Surface Water Level (ft):	21
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	81
Completion Date:	19970410000000.000	Depth to Bedrock (ft):	39
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	938	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB113
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000666142**

Database:	Water Well Database	Well Log #:	977071
Well Type:	Water Well	Drill Type:	ROTARY

Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	2711
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	1
Screen Length (ft):	Not Reported	Total Depth (ft):	120
Completion Date:	20040506000000.000	Depth to Bedrock (ft):	48
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB114
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000666143**

Database:	Water Well Database	Well Log #:	977116
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Pumping	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL AND CLAY	Permit #:	2711
Test Rate (gpm):	1	Draw Down:	17
Test Duration:	3	Surface Water Level (ft):	5
Date Measured:	20040728000000.000	Casing Height (ft):	1
Screen Length (ft):	5	Total Depth (ft):	22
Completion Date:	20040728000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	951.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB115
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000535381**

Database:	Water Well Database	Well Log #:	144920
Well Type:	Sealing Report	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	120
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Well Condition: New Dry Hole		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AA116
North
1/2 - 1 Mile
Lower

OH WELLS **OHD900000646844**

Database:	Water Well Database	Well Log #:	966717
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	2694
Test Rate (gpm):	10	Draw Down:	Not Reported
Test Duration:	5	Surface Water Level (ft):	75
Date Measured:	20040407000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	133
Completion Date:	20040407000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	892.6	Well Drilled By:	Not Reported
Comments:	Not Reported		

AA117
North
1/2 - 1 Mile
Lower

OH WELLS **OHD900000863395**

Database:	Water Well Database	Well Log #:	1020739
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	50
Test Duration:	4	Surface Water Level (ft):	71
Date Measured:	20190927000000.000	Casing Height (ft):	1.5
Screen Length (ft):	3	Total Depth (ft):	135
Completion Date:	20190927000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	CONTINOUS WIRE WOUND
Screen Material:	STAINLESS STEEL	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Clear		

AC118
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000449292**

Database:	Water Well Database	Well Log #:	506928
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	1
Test Duration:	1.5	Surface Water Level (ft):	31
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	41
Completion Date:	19770428000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	903.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

AC119
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000449284**

Database:	Water Well Database	Well Log #:	506930
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	3
Test Duration:	1.5	Surface Water Level (ft):	30
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	41
Completion Date:	19770428000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	905	Well Drilled By:	Not Reported
Comments:	Not Reported		

AB120
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000535380**

Database:	Water Well Database	Well Log #:	149758
Well Type:	Sealing Report	Drill Type:	ROTARY
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	Not Reported	Permit #:	2711
Test Rate (gpm):	Not Reported	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	20040817000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	201
Completion Date:	Not Reported	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Inadequate - Produced Gas Plugged		

AB121
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000666019**

Database:	Water Well Database	Well Log #:	982766
Well Type:	Water Well	Drill Type:	ROTARY

Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	LIMESTONE AND SHALE	Permit #:	2711
Test Rate (gpm):	1	Draw Down:	Not Reported
Test Duration:	Not Reported	Surface Water Level (ft):	Not Reported
Date Measured:	20040817000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	201
Completion Date:	20040817000000.000	Depth to Bedrock (ft):	46
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	Not Reported	Well Drilled By:	Not Reported
Comments:	Plugged		

AD122
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000809409**

Database:	Water Well Database	Well Log #:	2040117
Well Type:	Water Well	Drill Type:	AIR ROTARY
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	3301
Test Rate (gpm):	2	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	62
Date Measured:	20120922000000.000	Casing Height (ft):	1.6
Screen Length (ft):	15	Total Depth (ft):	84
Completion Date:	20120922000000.000	Depth to Bedrock (ft):	84
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	5	Screen Type:	MACHINE SLOTTED
Screen Material:	PVC	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	874	Well Drilled By:	Not Reported
Comments:	Well Made 1 1/2 - 2 Gallon Per Minute Their Was Two Screens The 15’ And A 3’ .020 Slot Continous Wire Wound Screen At 64’-67’		

AB123
SSE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000451944**

Database:	Water Well Database	Well Log #:	824600
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	Not Reported
Test Duration:	2	Surface Water Level (ft):	17
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	80
Completion Date:	19951127000000.000	Depth to Bedrock (ft):	42
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	939.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

124
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000427882**

Database:	Water Well Database	Well Log #:	552510
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	12	Draw Down:	Not Reported
Test Duration:	3	Surface Water Level (ft):	50
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	102
Completion Date:	19790503000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	950	Well Drilled By:	Not Reported
Comments:	Not Reported		

AE125
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000451069**

Database:	Water Well Database	Well Log #:	92018
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	ROCK	Permit #:	Not Reported
Test Rate (gpm):	18	Draw Down:	18
Test Duration:	.5	Surface Water Level (ft):	14
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	40
Completion Date:	19540925000000.000	Depth to Bedrock (ft):	18
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	974.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

126
NW
1/2 - 1 Mile
Higher

OH WELLS **OHD900000427883**

Database:	Water Well Database	Well Log #:	447193
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	10
Test Duration:	2	Surface Water Level (ft):	56
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	103
Completion Date:	19740430000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	944.3	Well Drilled By:	Not Reported
Comments:	Not Reported		

AE127
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000251521**

Database:	Water Well Database	Well Log #:	848511
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	LIMESTONE	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	0
Test Duration:	24	Surface Water Level (ft):	4
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	90
Completion Date:	19970330000000.000	Depth to Bedrock (ft):	14
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	988.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

AE128
South
1/2 - 1 Mile
Higher

OH WELLS **OHD900000637658**

Database:	Water Well Database	Well Log #:	916589
Well Type:	Water Well	Drill Type:	CABLE TOOL
Test Type:	Bailing	Well Use:	DOMESTIC
Aquifer Type:	SHALE	Permit #:	2306
Test Rate (gpm):	20	Draw Down:	15
Test Duration:	4	Surface Water Level (ft):	15
Date Measured:	20000807000000.000	Casing Height (ft):	2
Screen Length (ft):	Not Reported	Total Depth (ft):	50
Completion Date:	20000808000000.000	Depth to Bedrock (ft):	25
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	977.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

129
North
1/2 - 1 Mile
Higher

OH WELLS **OHD900000428510**

Database:	Water Well Database	Well Log #:	74618
Well Type:	Water Well	Drill Type:	Not Reported

Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	Not Reported	Draw Down:	0
Test Duration:	2	Surface Water Level (ft):	43
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	127
Completion Date:	19480505000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	930.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

AC130
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000449285**

Database:	Water Well Database	Well Log #:	484658
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SHALE	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	10
Test Duration:	3	Surface Water Level (ft):	35
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	75
Completion Date:	19750610000000.000	Depth to Bedrock (ft):	69
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	877.5	Well Drilled By:	Not Reported
Comments:	Not Reported		

AF131
ENE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000428522**

Database:	Water Well Database	Well Log #:	603715
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	15
Test Duration:	4	Surface Water Level (ft):	40
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	164
Completion Date:	19820910000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	901.7	Well Drilled By:	Not Reported
Comments:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

AF132
ENE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000634926**

Database:	Water Well Database	Well Log #:	898076
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Air	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL AND CLAY	Permit #:	2134
Test Rate (gpm):	65	Draw Down:	10
Test Duration:	1	Surface Water Level (ft):	45
Date Measured:	19990712000000.000	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	90
Completion Date:	19990712000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	897.1	Well Drilled By:	Not Reported
Comments:	Not Reported		

AF133
ENE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000428521**

Database:	Water Well Database	Well Log #:	528607
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	10	Draw Down:	2
Test Duration:	2	Surface Water Level (ft):	40
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	55
Completion Date:	19781122000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	902.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

AD134
ESE
1/2 - 1 Mile
Lower

OH WELLS **OHD900000268811**

Database:	Water Well Database	Well Log #:	859884
Well Type:	Water Well	Drill Type:	ROTARY
Test Type:	Not Reported	Well Use:	DOMESTIC
Aquifer Type:	GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	15	Draw Down:	0
Test Duration:	0	Surface Water Level (ft):	29
Date Measured:	Not Reported	Casing Height (ft):	0
Screen Length (ft):	Not Reported	Total Depth (ft):	50
Completion Date:	19970909000000.000	Depth to Bedrock (ft):	Not Reported

Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	898.8	Well Drilled By:	Not Reported
Comments:	Not Reported		

AF135
ENE **OH WELLS** **OHD900000428520**
1/2 - 1 Mile
Lower

Database:	Water Well Database	Well Log #:	535916
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	30	Draw Down:	20
Test Duration:	2	Surface Water Level (ft):	55
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	142
Completion Date:	19781015000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	892	Well Drilled By:	Not Reported
Comments:	Not Reported		

136
ENE **OH WELLS** **OHD900000428519**
1/2 - 1 Mile
Lower

Database:	Water Well Database	Well Log #:	511082
Well Type:	Water Well	Drill Type:	Not Reported
Test Type:	Not Reported	Well Use:	Not Reported
Aquifer Type:	SAND AND GRAVEL	Permit #:	Not Reported
Test Rate (gpm):	20	Draw Down:	25
Test Duration:	2	Surface Water Level (ft):	64
Date Measured:	Not Reported	Casing Height (ft):	Not Reported
Screen Length (ft):	Not Reported	Total Depth (ft):	164
Completion Date:	19770613000000.000	Depth to Bedrock (ft):	Not Reported
Drill Year:	Not Reported	Well Seal Report #:	Not Reported
Screen Diameter (in):	Not Reported	Screen Type:	Not Reported
Screen Material:	Not Reported	Pump Type:	Not Reported
Pump Capacity (gpm):	Not Reported	Pump Installed By:	Not Reported
Water Level Elev (ft):	883.9	Well Drilled By:	Not Reported
Comments:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: OH Radon

Radon Test Results

Zipcode	Num Tests	Maximum	Minimum	Arith Mean	Geo Mean
45381	109	90.3	0.1	8.27	4.23

Federal EPA Radon Zone for PREBLE County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for PREBLE COUNTY, OH

Number of sites tested: 4

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	4.050 pCi/L	75%	25%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Public Water System Data
Source: Ohio Environmental Protection Agency
Telephone: 614-644-2752
The database includes community, transient non-community and non-transient non-community water wells; and source treatment unit locations.

Water Treatment Facilities
Source: Ohio Environmental Protection Agency
Telephone: 614-644-2752

Water Well Database
Source: Department of Natural Resources
Telephone: 614-265-6740

Monitoring Water Wells Listing
Source: Department of Natural Resources
Telephone: 614-265-6740

OTHER STATE DATABASE INFORMATION

Oil and Gas Wells Listing
Source: Department of Natural Resources
Telephone: 614-265-6740
A listing of oil and gas well locations in the state.

RADON

State Database: OH Radon
Source: Department of Health
Telephone: 614-644-2727
Radon Statistics for Zip Code Areas

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

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APPENDIX F

HISTORICAL RECORDS

ODOT Preble CO

234 Quaker Trace Rd

West Alexandria, OH 45381

Inquiry Number: 7728002.4

August 06, 2024

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

08/06/24

Site Name:

ODOT Preble CO
234 Quaker Trace Rd
West Alexandria, OH 45381
EDR Inquiry # 7728002.4

Client Name:

Resource International
6350 Presidential Gateway
Columbus, OH 43231
Contact: Kristy Engel-Shepard

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Resource International were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# 24-B001
Project: ODOT Preble Co

Coordinates:

Latitude:	39.741203 39° 44' 28" North
Longitude:	-84.57426 -84° 34' 27" West
UTM Zone:	Zone 16 North
UTM X Meters:	707851.47
UTM Y Meters:	4401847.81
Elevation:	976.00' above sea level

Maps Provided:

2019
2016
2013
1987
1974
1961
1907, 1911

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2019 Source Sheets

West Alexandria
2019
7.5-minute, 24000

Lewisburg
2019
7.5-minute, 24000

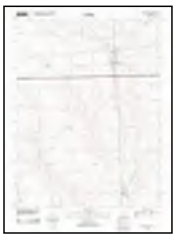
2016 Source Sheets

West Alexandria
2016
7.5-minute, 24000

Lewisburg
2016
7.5-minute, 24000

2013 Source Sheets

West Alexandria
2013
7.5-minute, 24000



Lewisburg
2013
7.5-minute, 24000

1987 Source Sheets

West Alexandria
1987
7.5-minute, 24000
Aerial Photo Revised 1984

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1974 Source Sheets

Lewisburg
1974
7.5-minute, 24000
Aerial Photo Revised 1974

1961 Source Sheets

West Alexandria
1961
7.5-minute, 24000
Aerial Photo Revised 1959

Lewisburg
1961
7.5-minute, 24000
Aerial Photo Revised 1959

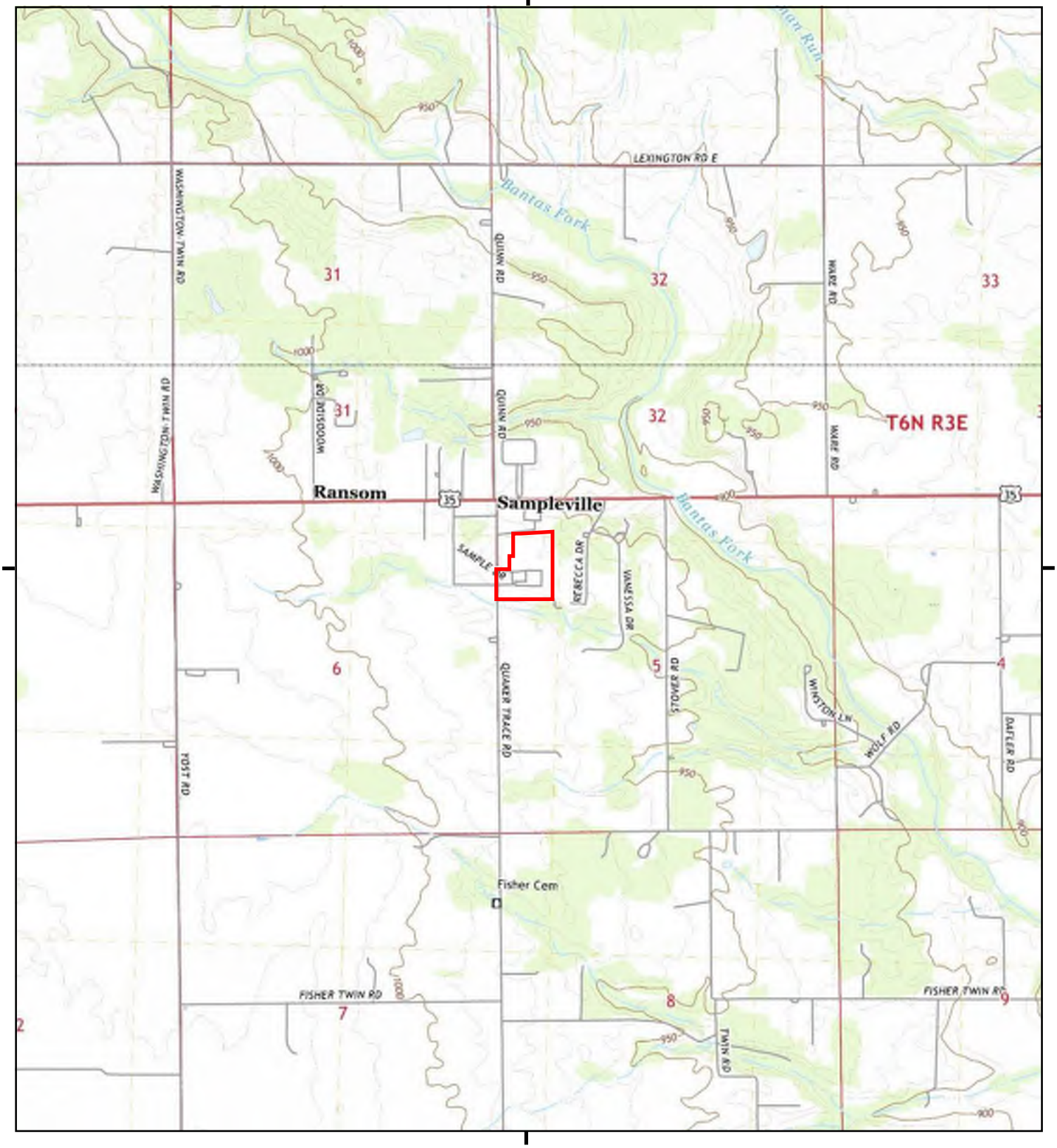
1907, 1911 Source Sheets

WEST MANCHESTER
1907
15-minute, 62500

Oxford
1911
15-minute, 62500

Historical Topo Map

2019



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

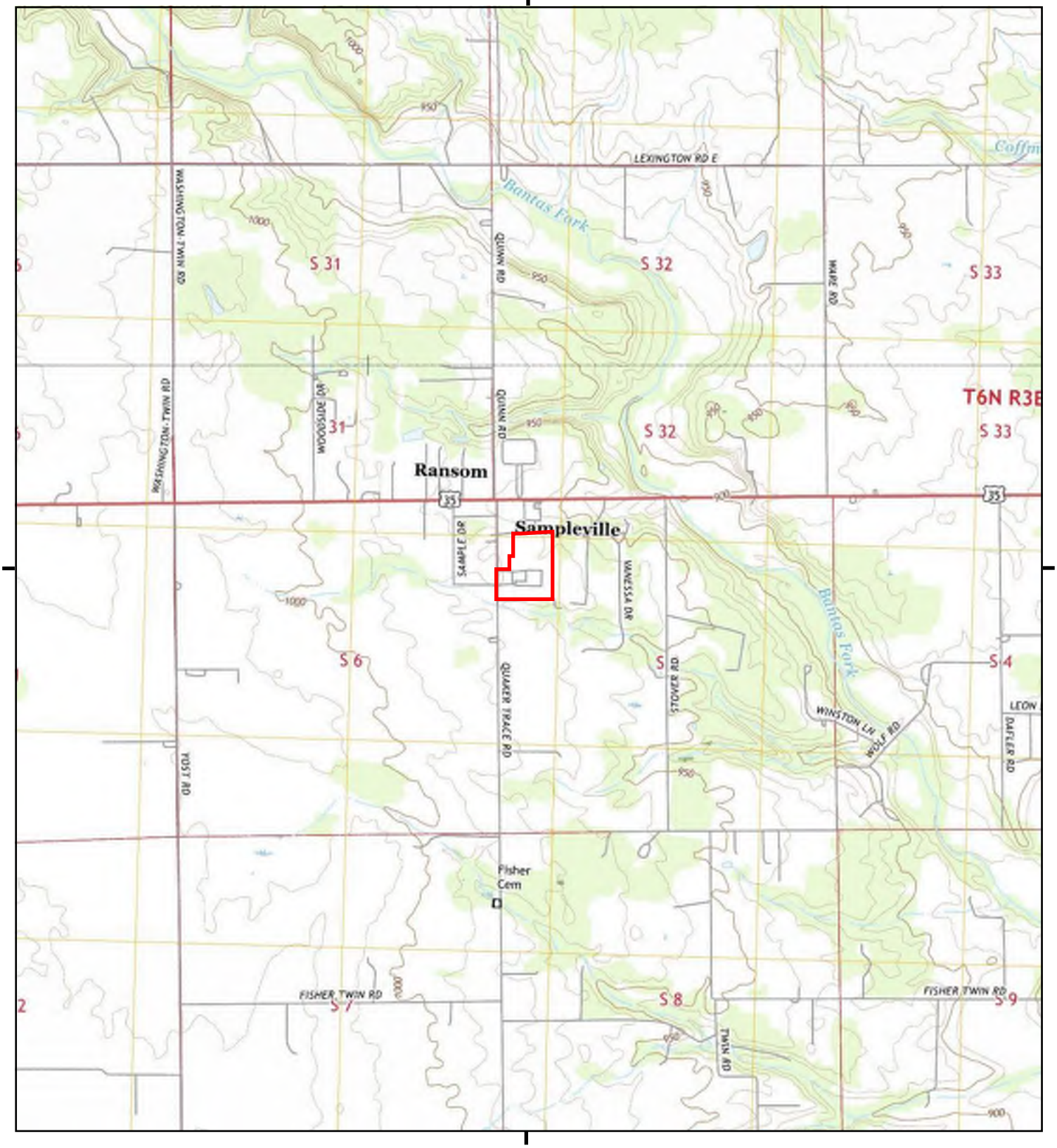
TP, West Alexandria, 2019, 7.5-minute
N, Lewisburg, 2019, 7.5-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N

Historical Topo Map

2016



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

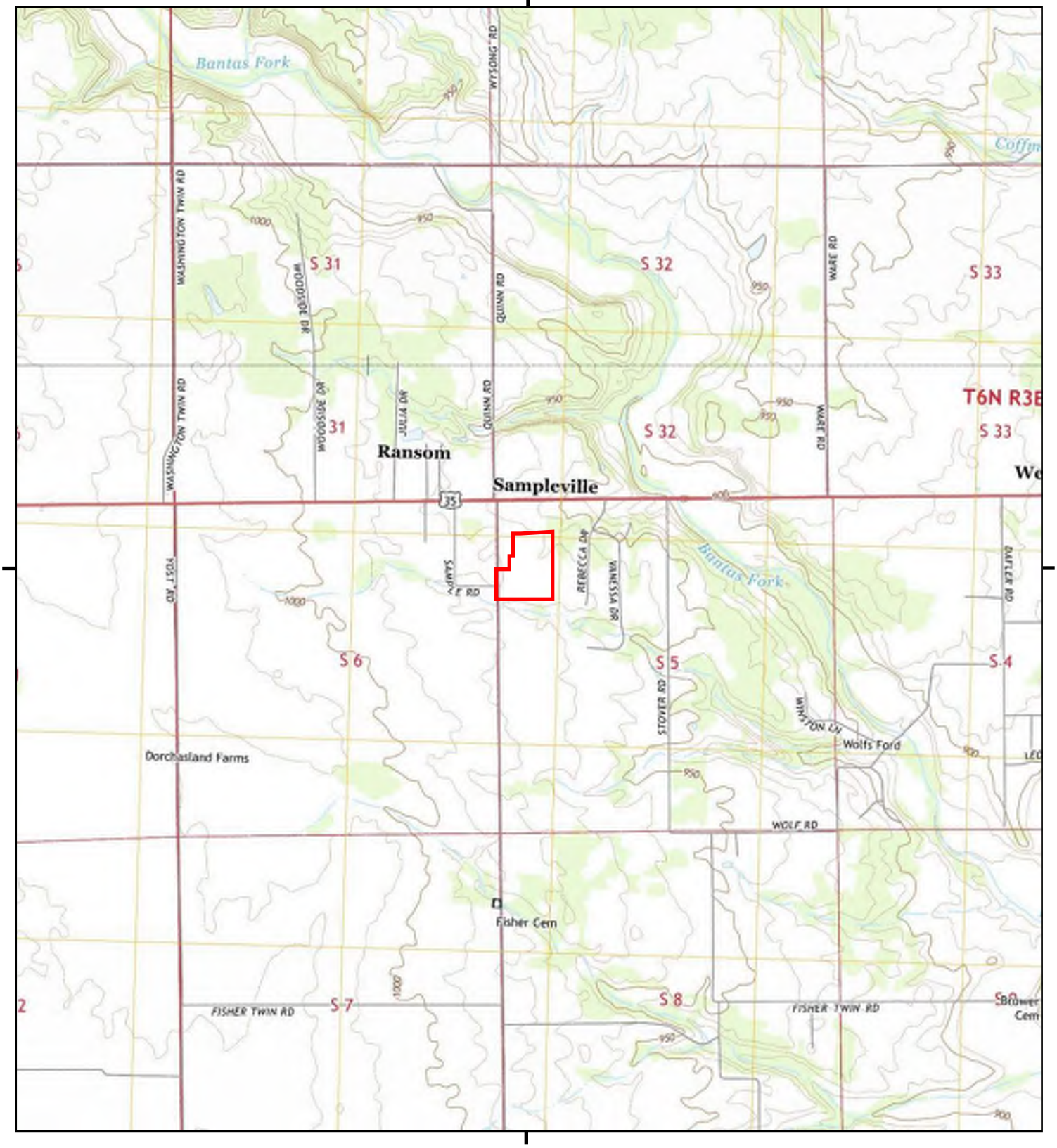
TP, West Alexandria, 2016, 7.5-minute
N, Lewisburg, 2016, 7.5-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N

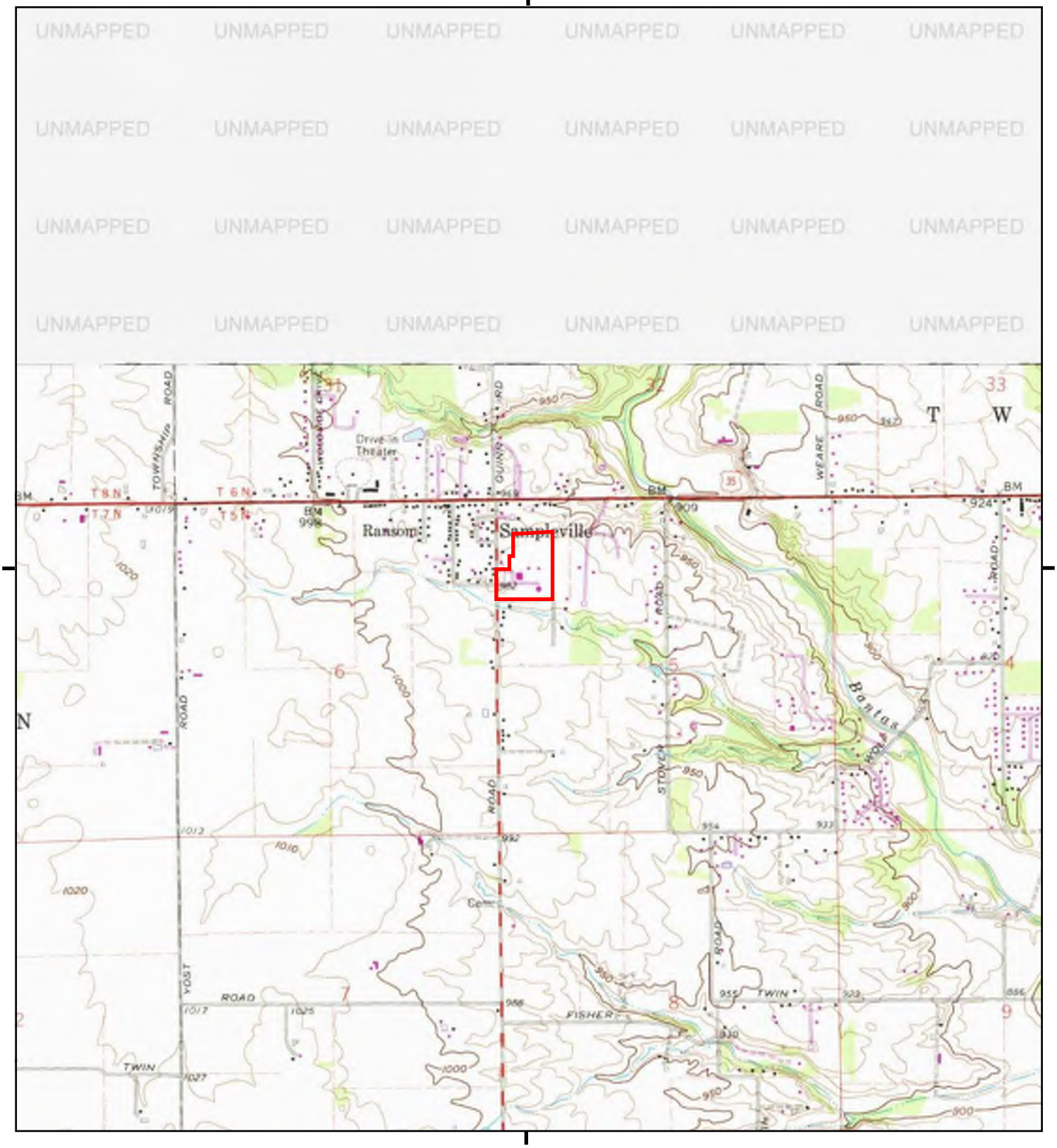
Historical Topo Map

2013


Bantas Fork
WYSONG RD
WASHINGTON TWIN RD
S 31
S 32
S 33
QUINN RD
WARE RD
T6N R3E
Ransom
Sampleville
35
RD 305
JULIA DR
RD 305
RD 305
RD 305

Historical Topo Map

1987



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

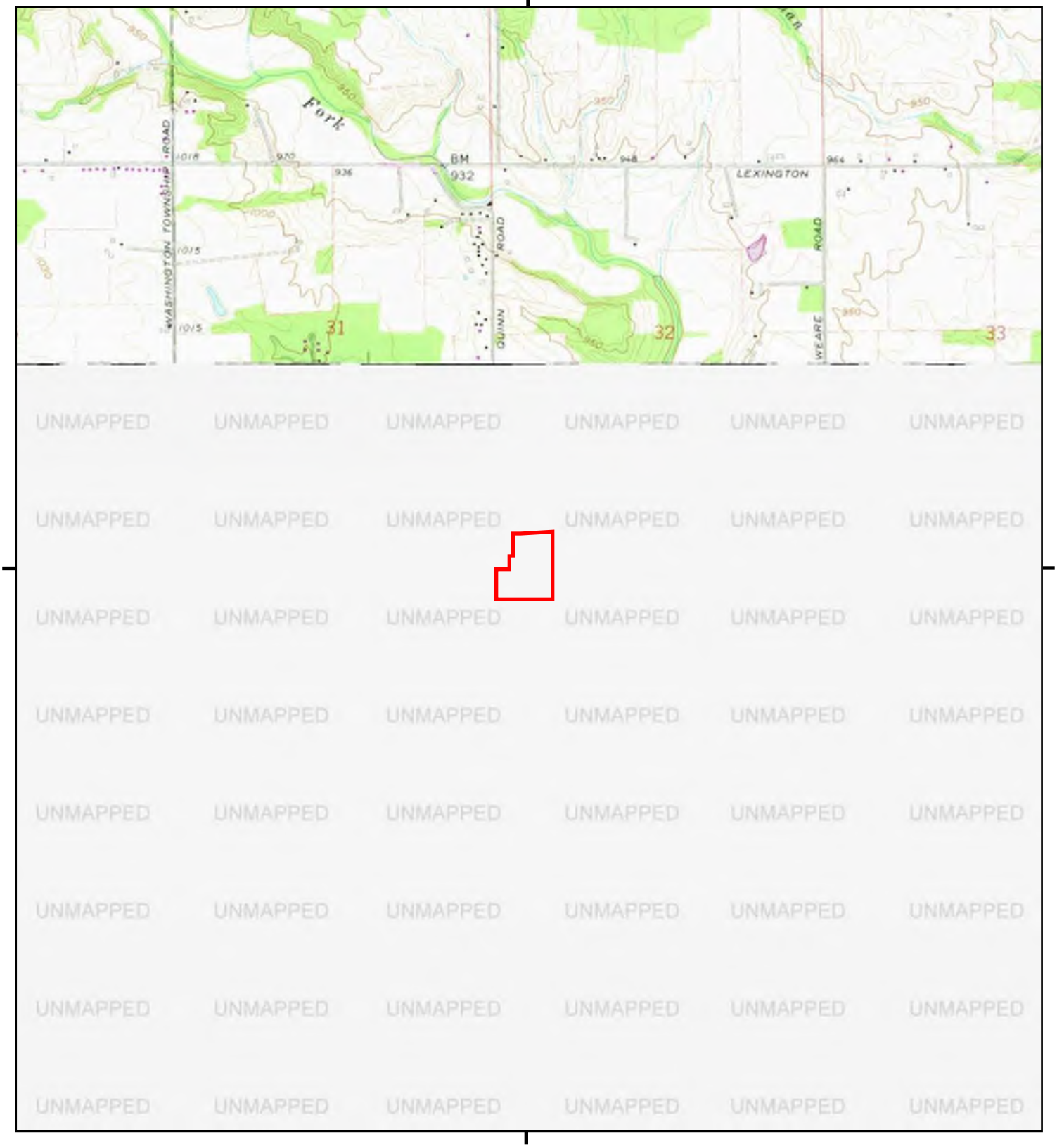
TP, West Alexandria, 1987, 7.5-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N

Historical Topo Map

1974



This report includes information from the following map sheet(s).

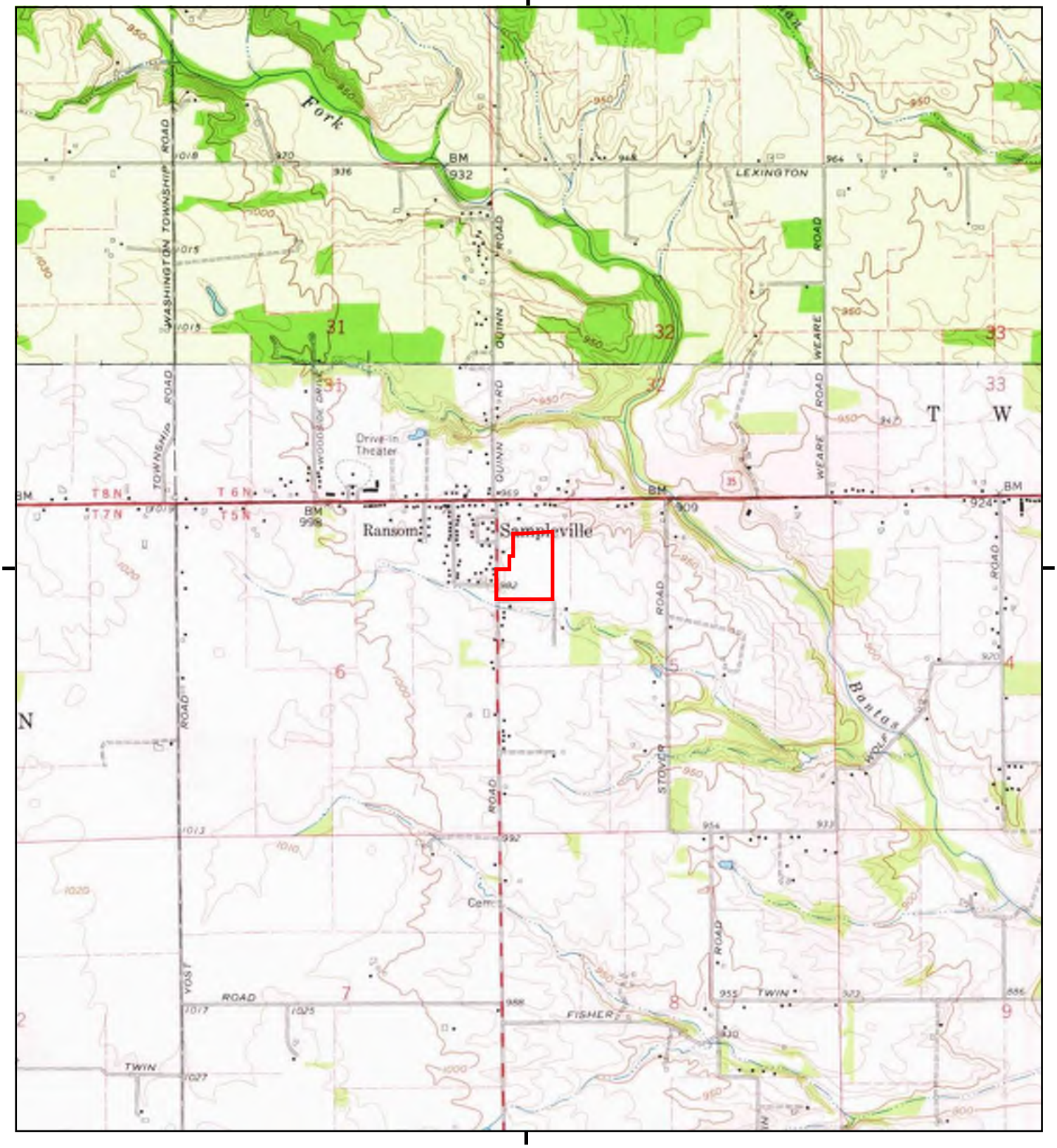
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

N, Lewisburg, 1974, 7.5-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N



This report includes information from the following map sheet(s).

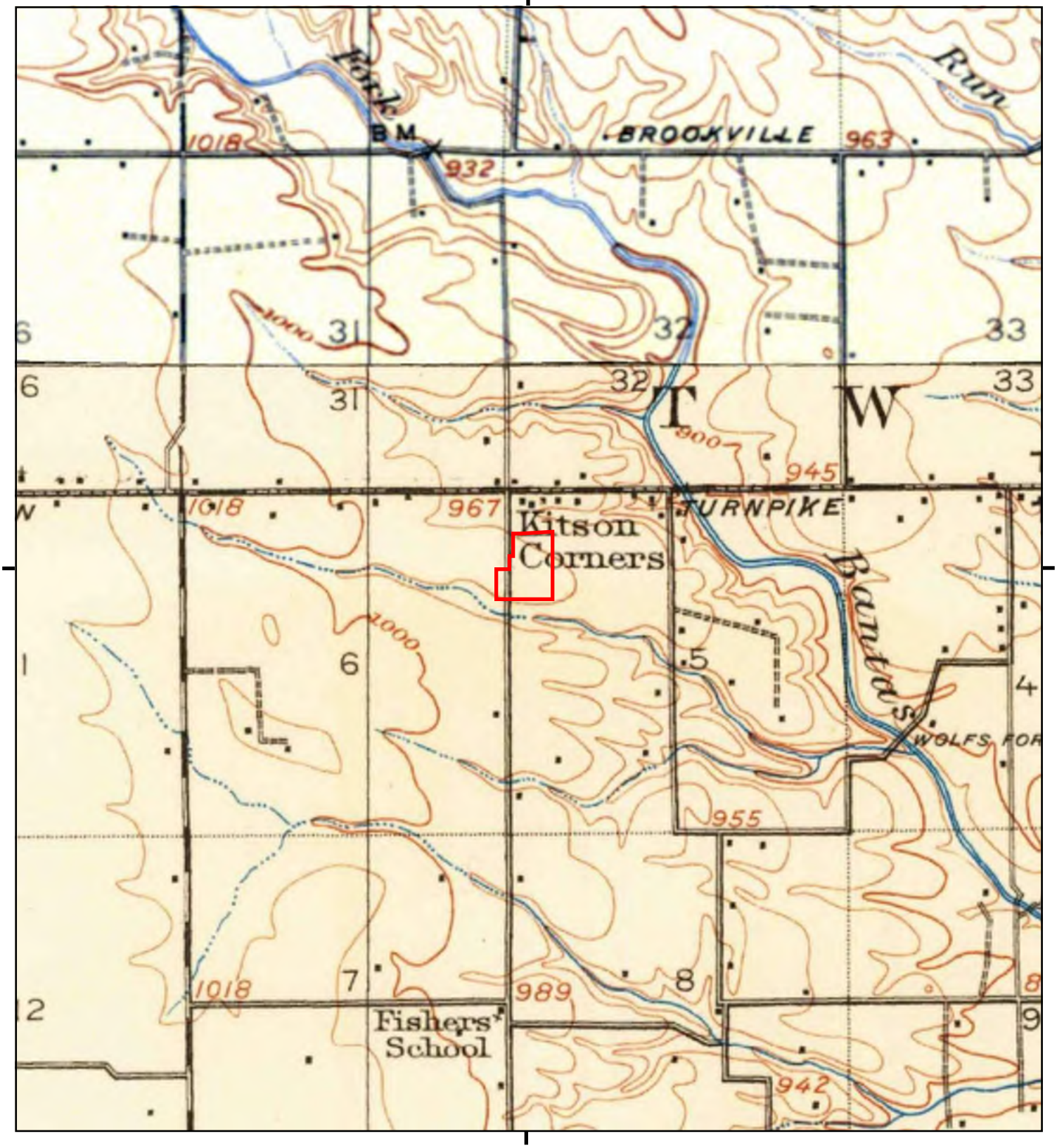
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, West Alexandria, 1961, 7.5-minute
N, Lewisburg, 1961, 7.5-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Oxford, 1911, 15-minute
N, WEST MANCHESTER, 1907, 15-minute

SITE NAME: ODOT Preble CO
ADDRESS: 234 Quaker Trace Rd
West Alexandria, OH 45381
CLIENT: Resource International

N

ODOT Preble CO
234 Quaker Trace Rd
West Alexandria, OH 45381

Inquiry Number: 7728002.5
August 09, 2024

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available business directory data at approximately five year intervals.

RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	*Target Street*	*Cross Street*	*Source*
2020	☑	☑	EDR Digital Archive
2017	☑	☑	Cole Information
2014	☑	☑	Cole Information
2010	☑	☑	Cole Information
2005	☑	☑	Cole Information
2000	☑	☑	Cole Information
1995	☑	☑	Cole Information
1992	☑	☑	Cole Information
1990	☐	☐	Haines Criss-Cross Directory
1985	☐	☐	Haines Criss-Cross Directory
1980	☐	☐	Haines Criss-Cross Directory
1975	☐	☐	Haines Criss-Cross Directory
1969	☐	☐	Haines Criss-Cross Directory
1962	☐	☐	Haines Criss-Cross Directory
1958	☐	☐	Haines Criss-Cross Directory
1951	☐	☐	Haines Criss-Cross Directory
1947	☐	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

234 Quaker Trace Rd
West Alexandria, OH 45381

Year	*CD Image*	*Source*	

QUAKER TRACE RD

2020	pg A2	EDR Digital Archive	
2017	pg A10	Cole Information	
2014	pg A14	Cole Information	
2010	pg A18	Cole Information	
2005	pg A22	Cole Information	
2000	pg A26	Cole Information	
1995	pg A29	Cole Information	
1992	pg A33	Cole Information	
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source
1975	-	Haines Criss-Cross Directory	Street not listed in Source
1969	-	Haines Criss-Cross Directory	Street not listed in Source
1962	-	Haines Criss-Cross Directory	Street not listed in Source
1958	-	Haines Criss-Cross Directory	Street not listed in Source
1951	-	Haines Criss-Cross Directory	Street not listed in Source
1947	-	Haines Criss-Cross Directory	Street not listed in Source

FINDINGS

CROSS STREETS

Year	*CD Image*	*Source*	
QUINN RD			
2020	pg. A5	EDR Digital Archive	
2017	pg. A12	Cole Information	
2014	pg. A16	Cole Information	
2010	pg. A20	Cole Information	
2005	pg. A24	Cole Information	
2000	pg. A27	Cole Information	
1995	pg. A31	Cole Information	
1992	pg. A34	Cole Information	
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source
1980	-	Haines Criss-Cross Directory	Street not listed in Source
1975	-	Haines Criss-Cross Directory	Street not listed in Source
1969	-	Haines Criss-Cross Directory	Street not listed in Source
1962	-	Haines Criss-Cross Directory	Street not listed in Source
1958	-	Haines Criss-Cross Directory	Street not listed in Source
1951	-	Haines Criss-Cross Directory	Street not listed in Source
1947	-	Haines Criss-Cross Directory	Street not listed in Source
US ROUTE 35 E			
2020	pg. A8	EDR Digital Archive	
2017	pg. A13	Cole Information	
2014	pg. A17	Cole Information	
2010	pg. A21	Cole Information	
2005	pg. A25	Cole Information	
2000	pg. A28	Cole Information	
1995	pg. A32	Cole Information	
1992	pg. A35	Cole Information	
1990	-	Haines Criss-Cross Directory	Street not listed in Source
1985	-	Haines Criss-Cross Directory	Street not listed in Source

FINDINGS

Year	CD Image	Source	
1980	-	Haines Criss-Cross Directory	Street not listed in Source
1975	-	Haines Criss-Cross Directory	Street not listed in Source
1969	-	Haines Criss-Cross Directory	Street not listed in Source
1962	-	Haines Criss-Cross Directory	Street not listed in Source
1958	-	Haines Criss-Cross Directory	Street not listed in Source
1951	-	Haines Criss-Cross Directory	Street not listed in Source
1947	-	Haines Criss-Cross Directory	Street not listed in Source

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

QUAKER TRACE RD 2020

32	AMBER JOHNSON
	ANDRE STEWART
	CATHERINE TURNER
	DANI PIERATT
	DONALD YOUTSEY
	HOWARD PUGH
	JAMES WARNER
	JESSIE BAKER
	JOSHUA STEWART
	KENNETH MORGAN
	LISA DUNBAR
	LISA PUTERBAUGH
	MELVIN STEWART
	MICAH BURIG
	NICHOLAS YOUTSEY
	PATRICIA ASHLEY
	REBECCA MORGAN
	RICKY STRADER
	SONYA GOSE
	STANLEY WARNER
	TABITHA BURIG
	VALERIE CROFT
71	DUSTIN DUVALL
	SARAH EVANS
77	GERALD WARREN
	HAROLD WARREN
79	HALEY WHEELER
	JEREMIAH WHEELER
86	GREGG GOLDY
	JENNIFER GOLDY
	JENNIFER SHAFFER
	KEITH GOLDY
	KEITH HOWARD
93	DENISE ROBERTSON
117	MARY BAUGHMAN
	RITA HUTCHINGS
	SARAH HUTCHINGS
133	AMY PEMBERTON
	ANNAH PEMBERTON
	JAMES PEMBERTON
	LANCE PEMBERTON
137	OLIVER ADAMS
142	BRENDA WISE
	JERRY MCMURRAY
	STEPHANIE BLAYLOCK
160	EDNA MILLER
	JERRY MILLER
	JOSHUA COMBS
175	JARRED UPCHURCH
	JULIE UPCHURCH

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

QUAKER TRACE RD 2020 (Cont'd)

175	TANNER UPCHURCH
	TRACEY UPCHURCH
187	CONRAD HOLT
	ROSE HOLT
193	DEBORAH NAPIER
	HEATHER PENNINGTON
	RICHARD ARMSTRONG
207	DARRELL PEMBERTON
	KRISTEN PEMBERTON
	LUTHER PEMBERTON
225	DAISY PEMBERTON
	GLEN PEMBERTON
	RALPH EVANS
245	CODY SMITH
	JEFFERY HILL
	TERESA HILL
	TERESA SMITH
304	DARRELL MCKEE
	KATHY MCKEE
	MICHAEL MCKEE
	TIM MCKEE
314	AMY MERFERT
	RUSS GOINS
344	RANDALL ALCORN
	RANDALL MARTIN
358	BARBARA DILLON
378	SHAWN BRYAN
	SYLVIA CLAYTON
	TERESA BRYAN
380	BRIAN OVERHOLTS
	KRISTOFER MOORE
	LORISSA HOCHSTETLER
427	ROBERT WRIGHT
	SHIRLEY HEYOB
430	REX BRUBAKER
	WALTER LINDSEY
495	AUDREY GRUBBS
670	BRANDON WISEMAN
	BRENDA WISE
	JASON POTEET
	STAN HORNSBY
706	JEREMY MATHEWS
	JEREMY SMITH
	MICHELLE MATHEWS
716	JOSHUA RALSTON
	NATHAN RALSTON
730	ANITA SHOCKLEY
	GLENN SPURLOCK
756	CARL BECHTOL
	LOGAN BECHTOL

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

QUAKER TRACE RD 2020 (Cont'd)

756	ROBERT BECHTOL
	TAMMY BECHTOL
766	CRAIG DEATON
	RHONDA DEATON
1025	DANIELLE KRICKENBARGER
	DOUG KRICKENBARGER
	LISA KRICKENBARGER
	LUCAS KRICKENBARGER
1107	AMY DAUGHERTY
	DAVID DAUGHERTY
	JESSICA DAUGHERTY
1156	VERNON DENLINGER
1428	ROBERT COLLINS
	SHERLY COLLINS
1456	DAVID LESH
	SHARON LESH
1551	DINO HELKE
	JON HELKE
	NANCY HELKE
1987	JASON MILLER
2414	PAUL DAVIS
	TAMMY DAVIS
2615	ELLEN BRUBAKER
2918	STACY BRUBAKER
3130	BRENTON BRUBAKER
	SARAH BRUBAKER
3320	BETHANY BRUBAKER
	RYAN BRUBAKER
3598	SHERYL DEATON
3674	SHARON MILLER
3700	ASHLEY EVICK
	DALE LYNCH
	DANIEL LYNCH
	KRISTEN LYNCH
	SHIRLEY LYNCH

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

QUINN RD 2020

33	DENNIS KERSHNER
36	DAVID FLORY
	DONNA GARDNER
	MICHAEL GARDNER
77	MARY HOWARD
109	KENDRA CREECH
	ROBERT CREECH
131	JESSICA DAVIS
	ROGER DAVIS
169	CELIA COMBS
	HENRY COMBS
239	PATRICK GILLESPIE
	SCOTT BIXLER
252	ANTHONY BUSCHUR
	BEVERLY BUSCHUR
	RAYMOND BUSCHUR
	TONYA BUSCHUR
263	JACOB PITCOX
	NANCY POLLOCK
274	DORIS KIRACOFE
	EILEEN KIRACOFE
301	RICHARD CLAYTON
	SYLVIA CLAYTON
	TINA MARKER
333	CODY CLAYTON
	MISTY CLAYTON
	RICHARD CLAYTON
339	LAWRENCE PATRIARCA
	LORNA PATRIARCA
367	BRADLEY GREEN
	KEVIN HOWARD
	MELISSA GREEN
381	JUSTIN MCGUIRE
	KIMBERLY MCGUIRE
383	DAVID HALE
	GREGORY ALLEN
	SHEILIA CONLEY
385	KORD MCGUIRE
	PATTY MCGUIRE
	WESLEY MCGUIRE
395	SHEILA CONLEY
	VERONA LOWE
396	BELINDA SIVILS
	ELISHA SIVILS
	GARY SIVILS
	TIFFANY SIVILS
397	JERALDINE HUMPHREY
501	MARQUIS MOORE
	TIFFANY MOORE
529	DENTON BLAYLOCK

QUINN RD 2020 (Cont'd)

529	DOROTHY CARMACK
	EDWARD BLAYLOCK
	PAT BLAYLOCK
	WILLA BLAYLOCK
531	ASHLEY SCHILLING
	JERADITH RADER
	MELYNDA LEWIS
	TABATHA RADER
616	CCW
	DAN DAY
	NORMA DAY
665	HENRY BRIGHT
	JASON DELONG
	JENNIFER DELONG
	KAYLA NUNNERY
	ROBERT BRIGHT
	WENDY BRIGHT
685	FRANCIS NAUDASCHER
	JAYCIE FISHER
	JOHN FISHER
	RHINDA NAUDASCHER
711	ELLEN KING
725	DANIEL BISHOP
	STEVEN WILMOT
730	ADAM DAY
	DANIEL DAY
	DEBRA DAY
	MARIE HARRISON
733	DIANE OLIVER
	ELIVA OLIVER
	PAUL OLIVER
745	DALE MELTON
	MICAH BURTON
	RACHEL LAMBERTSON
761	GEORGE MCINTOSH
809	GREGORY CLINE
	JENNIFER CLINE
	RAVEN CLINE
815	BRANDON GIBSON
	JEFFREY GIBSON
	LESLEY GIBSON
	STEVEN GIBSON
909	ANTHONY ADKINS
	ASHLEY BRADFORD
	SARAH CAMPER
	SHERRIE ADKINS
931	KIMBERLEE KELLER
963	CHERYL WASHINGTON
	MICHAEL WASHINGTON
	RANCE PEGG

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

QUINN RD 2020 (Cont'd)

983 DUSTIN PEGG
HEATHER PEGG
1037 CAROLYN FULLER
DONNA BAKER
EARL BAKER
GAIL BAKER

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

US ROUTE 35 E 2020

3009	DEBRAH ANKROM
	LEXIE KILLEN
	MELINDA PEGG
	MELINDA WARD
	MINDY WARD
3039	KAREN COLE
	MADISON ANKROM
	STACEY COLE
3046	ANNE POWERS
	BRADLEY MONEBRAKE
	MACY HOUNSHELL
	TESSA LOXLEY
3074	PAUL OLIVER
3088	CHARLES DELPH
	DEBBIE DELPH
3105	DAINEL GROVER
	MICHELLE GROVER
	RICKY PEASE
3119	BRANDI MARKER
	THOMAS FOSTER
3131	CHARLES GOSE
	CODY SHANNON
	RITA GOSE
	SABRINA GOSE
3153	MARTY COLE
	ROBIN COLE
3155	ALISHA GRUBB
	LEAH TAULBEE
	SHARON KINGSLEY
	SHARON TAULBEE
3157	CHRISTINE COLE
3163	KIMBERLY WATKINS
3184	KELLI SUTTON
3218	VINCENT OSTRANDER
3239	LISA MAYSE
	TIMOTHY MAYSE
	TY WALTON
3266	BANDY WOOLUMS
	PAULA SMITH
	RICHARD SMITH
	TERRY ANDERSON
	TIFFANY LYKINS
3288	SAMUEL RODEFFER
3376	ADAM FALLDORF
	DARRELL CLARK
	RV DANGAR
3398	JAMES SIZEMORE
3418	JOANNA KELLEY
	JOHNNIE CLARK
3637	EILEEN WASHINGTON

Target Street	Cross Street	Source
-	✓	EDR Digital Archive

US ROUTE 35 E 2020 (Cont'd)

3637 GENE SPURLOCK
JANE WASHINGTON
MILDRED WASHINGTON
3640 DARRELL YOEDER
LISA YODER
3642 ANGELA MARCONETT
4042 GERALDINE MORROW
JOHN WARE
JULIA WARE
WHITNEY DELK

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2017

31	PHILLIPS, DAVID A
32	BAKER, JESSIE L
	BURIG, MICAH D
	GOSE, CHARLES
	GREGORY, JENNIFER J
	LAVINE, CHARLENE
	PIERATT, DANI
	PUTERBAUGH, KAREN S
	WARNER, STANLEY F
	YOUTSEY, NICHOLAS L
71	BUVALL, DUSTIN W
75	WARNER, JEANA M
79	WHEELER, JEREMIAH D
86	SHAFFER, AMY
103	LEIS, JAMES V
115	MARTIN, ONEDRA I
117	HUTCHINGS, JONATHAN A
133	PEMBERTON, LANCE K
137	ADAMS, OLIVER
142	BLAYLOCK, ROBYN D
175	UPCHURCH, TRACEY L
180	DAVIS, JERRY H
187	CRESS, PATRICIA A
193	NAPIER, JERRY
207	PEMBERTON, DOUG K
225	PEMBERTON, GLEN A
245	HILL, JEFFREY A
304	MCKEE, DARRELL L
344	MARTIN, RICHARD A
358	DILLON, BARBARA J
378	BRYAN, SHAWN D
380	HOCHSTETLER, LORISSA E
427	KEM, DONALD F
430	BRUBAKER, REX L
495	GREEN, HEATHER
670	WISE, JOHN C
706	MATHEWS, JEREMY D
716	RALSTON, JOSHUA A
730	SHOCKLEY, ANITA G
756	WHITE, BROOKE
766	DEATON, CRAIG A
904	NELSON, SANDRA S
1025	KRICKENBARGER, DOUG L
1107	DAUGHTERY, DAVID E
1156	DENLINGER, VERNON A
1428	COLLINS, ROBERT L
1551	HELKE, JEFFREY L
1987	MILLER, JASON M
2100	FULTZ, GENE H
2414	DAVIS, TAMMY M

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2017 (Cont'd)

2615	BRUBAKER, ELLEN A
2918	BRUBAKER GRAIN & CHEMICAL
	BRUBAKER, GALEN
3130	BOWER, GREG A
3320	BRUBAKER, BETHANY J
3576	BRUBAKER, DARRELL L
3598	QUAKER TRACE TRACTOR
3674	MILLER, ROBERT W
3700	EVICK, ASHLEY L

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 2017

33	KERSHNER, DENNIS N
36	FLORY, DAVID D
77	HOWARD, MARY J
131	DAVIS, JESSICA
169	COMBS, HENRY J
239	GILLESPIE-BIXLER, TRICIA D
252	BUSCHUR, RAYMOND E
263	HILDEBRAND, KENNETH W
274	KIRACOFE, EILEEN E
301	CLAYTON, RICHARD C
333	CLAYTON, COURTNEY
339	PATRIARCA, LAWRENCE D
367	GREEN, ROBERT L
381	MCGUIRE, JUSTIN L
383	CONLEY, SHEILA A
395	LOWE, WILLIAM E
396	SIVILS, GARY L
397	GALVAN, MELISSA
399	MCGUIRE, KORD L
529	BLAYLOCK, JAMES E
616	DAY, DAN J
665	BRIGHT, HENRY R
	DELONG, JASON R
685	FISHER, DEBBIE A
711	KING, ELLEN E
725	HAMILTON, BELINDA A
730	HARRISON, MARIE
733	OLIVER, PAUL J
745	BURTON, MICAH J
761	MCINTOSH, GEORGE L
809	CLINE, GREGORY M
888	DOLPH, EDWARD J
909	ADKINS, ALLEN F
931	KELLER, TONY R
963	WASHINGTON, MICHAEL N
983	CLAYTON, CODY
1037	BAKER, TEDDY C

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 2017

3009	COLE, STANLEY
3046	LOXLEY, TESSA J
3074	TACKETT, PHILLIP R
3088	OLIVER, LARRY K
3105	GROVER, DANIEL A
3119	TRUNCK, LORI L
3131	GOSE, CHARLES J
3138	MILLER, VEARL M
3153	COLE, MARTY L
3157	COLE, JUNIUS
3218	OSTRANDER, VINCENT P
3239	MAYSE, LISA
3266	ANDERSON, TERRY L
	NICOLE, BRANDI
	PHILLIPS, DAVID
3288	RODEFFER, SAMUEL A
3377	PREBLE MEMORY GARDENS
3418	KELLEY, JO
3435	SPURLOCK, GENE C
3457	HAWKINS APPLIANCE REPAIR
3637	WASHINGTON, HARLEY L
3640	YODER, DARRELL D
4042	WARE, JOHN M

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2014

31	PHILLIPS, DAVID A
32	ASHLEY, KELLY S
	BAKER, JESSIE L
	DUNBAR, LISA R
	GREGORY, JENNIFER J
	MORGAN, COREY A
	PIERATT, DANI
	PUGH, HOWARD A
	SHADE, MICHAEL A
	STRADER, RICKY
	WARNER, STANLEY F
	YOUTSEY, DONALD L
71	MOSS, REIKO B
73	EVANS, ELDEN S
77	WARREN, HAROLD W
79	SHAFFER, PAUL R
85	BISHOP, AMANDA
86	SHAFFER, DANIEL
93	DAMMEYER, CHERYL A
103	LEIS, JAMES V
115	MARTIN, ONEDRA I
117	HUTCHINGS, JONATHAN A
133	PEMBERTON, JIM L
137	MCKEE, LOWELL L
142	MCMURRAY, JEREMIAH J
160	MILLER, JERRY J
175	UPCHURCH, TRACEY L
180	OCCUPANT UNKNOWN,
187	CRESS, PATRICIA A
193	LAYCOCK, PENNIE
207	PEMBERTON, DOUG H
225	PEMBERTON, GLEN A
245	HILL, JEFFREY A
304	MCKEE, DARRELL L
314	TAYLOR, NATHAN L
344	MARTIN, RICHARD A
358	DILLON, BARBARA J
378	ALLBRIGHT, CECIL R
379	RICKS, RICHARD
380	BRUBAKER, BRENT E
427	KEM, DONALD F
430	BRUBAKER, REX L
495	OCCUPANT UNKNOWN,
511	FROCK, ROBIN L
649	HESTER, MICHAEL L
670	COX, CASEY
706	OCCUPANT UNKNOWN,
730	HOWARD, TERRY M
756	BECHTOL, CARL M
766	DEATON, CRAIG A

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2014 (Cont'd)

904	NELSON, SANDRA S
1025	KRICHENBARGER, LUCAS S
1107	DAUGHTERY, DAVID E
1156	DENLINGER, VERNON A
1296	MULLINS, TOM
1428	COLLINS, ROBERT L
1456	LESH, DAVID J
1551	KRICKENBARGER, KATHRYN E
1987	MILLER, JASON M
2100	FULTZ, GENE H
2414	DAVIS, PAUL D
2767	BRUBAKER, LEVI A
2918	BRUBAKER GAIN
	BRUBAKER, GALEN
3130	DUTTER, GALEN J
3160	GARBER, RICHARD
3320	BRUBAKER, RYAN L
3576	BRUBAKER, DARRELL L
3578	BRUBAKER, CHARLES
3598	QUAKER TRACE TRACTOR
3674	MILLER, ROBERT W

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 2014

33	KERSHNER, DENNIS N
36	FLORY, DAVID D
77	HOWARD, MARY J
109	OCCUPANT UNKNOWN,
131	CLOPPER, JESSICA
169	COMBS, HENRY J
239	BIXLER, SCOTT S
252	BUSCHUR, RAYMOND E
263	HILDEBRAND, KENNETH W
274	KIRACOFE, EILEEN D
301	CLAYTON, RICHARD C
333	CLAYTON, COURTNEY
339	GARCIA, O
381	MCGUIRE, JUSTIN L
383	CONLEY, SHEILA A
385	OCCUPANT UNKNOWN,
395	LOWE, WILLIAM E
396	SIVILS, GARY L
397	ODA, MELISSA S
399	MCGUIRE, KORD L
501	INGRAM, EDWARD E
529	BLAYLOCK, EDWARD P
531	LEWIS, CHARLES E
616	DAY, DAN J
665	BRIGHT, WENDY M
	DELONG, JENNIFER L
	OCCUPANT UNKNOWN,
685	FISHER, DEBBIE A
711	KING, ELLEN E
720	DAY, ADAM
725	HAMILTON, BELINDA A
733	OLIVER, PAUL J
745	LAMBERTSON, RACHEL
761	MCINTOSH, GEORGE L
809	CLINE, GREGORY M
815	GIBSON, LESLIE J
888	DOLPH, EDWARD J
909	ADKINS, ALLEN F
931	KELLER, TONY R
963	WASHINGTON, MICHAEL N
983	BAKER, TED C
1037	BAKER, EARL J

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 2014

3009	COLE, STANLEY
3039	SIZEMORE, STACEY R
3046	BOOSO, SCOTT
	LLOYD, CAROLYN C
	MONEBRAKE, BRADLEY E
3074	TACKETT, PHILLIP R
3088	OCCUPANT UNKNOWN,
3105	GROVER, DANIEL A
3119	OCCUPANT UNKNOWN,
3131	GOSE, CHARLES J
3138	MILLER, VEARL M
3153	COLE, ROBIN L
3155	TAULBEE, SHARON L
3157	COLE, JUNIUS
3163	WARD, MICHAEL T
3174	IMMICKE, VIRGINIA A
3218	SANDLIN, ALVIE J
3239	MAYSE, LISA
3266	LYKINS, TIFFANY A
	TENNEY, MAYFORD
3288	RODEFFER, SAMUEL A
3377	PREBLE MEMORY GARDENS
	REFLECTIONS @ PMGA BANQUET EVEN
	ROBERT L CROOKS FUNERAL CENTER
3418	OCCUPANT UNKNOWN,
3435	SPURLOCK, GENE C
3436	OCCUPANT UNKNOWN,
3457	HAWKINS APPLIANCE REPAIR
3626	BURRIS, BETTY
3637	WASHINGTON, HARLEY L
3640	MCLAUGHLIN, LIISA J
3642	OCCUPANT UNKNOWN,
4042	WARE, JOHN M

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2010

31	PHILLIPS, DAVID A
32	ASHLEY, PATRICIA A
	CRAUDER, G
	DUNBAR, LISA R
	HOWARD, AMY
	KIRBY, AMY
	MORGAN, COREY O
	PARAMORE, TIMOTHY
	PUGH, HOWARD
	TAYLOR, ADAM
	TURNER, CATHY E
	WARNER, STANLEY F
	YOUTSEY, DONALD L
73	EVANS, ELDEN S
77	WARREN, HAROLD W
85	BISHOP, AMANDA
86	SCHAFER, JENNIFER
103	LEIS, JAMES V
133	DAISY HOUND CREATIONS
	PEMBERTON, JIM L
142	BLAYLOCK, ROBYN D
160	MILLER, JERRY J
175	ASHLEY, DIANA L
180	SCHAFFER, JOSH W
187	HOLT, BERNARD V
193	JOHNSON, ALLISON
207	PEMBERTON, DOUG H
234	TRANSPORTATION DEPT
245	HILL, JEFFREY A
314	TAYLOR, NATHAN L
358	DILLON, BARBARA J
378	CLAYTON, RICHARD C
379	RICKS, RICHARD
380	DEARTH, PAMELA K
427	KEM, DONALD F
495	WOLTJA, JACK
649	HESTER, JOEY R
706	RALSTON, EDWARD R
730	HOWARD, CHARLES E
756	BECHTOL, CARL M
766	DEATON, CRAIG A
904	NELSON, ROBERT J
1025	KRICKENBARGER, DOUG L
1107	DAUGHTERY, DAVID E
1156	DENLINGER, VERNON A
1296	MULLINS, TOM
1551	GARRETT, KATHRYN
2100	FULTZ, GENE H
2313	WOODS, ROY A
2414	DAVIS, PAUL D

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2010 (Cont'd)

2918 BRUBAKER GRAIN & CHEMICAL
3130 COUNTRY CABINETS
DUTTER, GALEN J
3160 GARBER, RICHARD
3598 QUAKER TRACE TRACTOR SVC
3674 MILLER, ROBERT W
3700 KARNS, TERRY L

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 2010

33	KERSCHNER, DENNIS N
35	REDS AUTO SALES
36	FLORY, DAVID D
131	CHRISTIAN, JERRY K
252	BUSCHUR, RAYMOND E
263	HILDEBRAND, KENNETH W
274	KIRACOFE, EILEEN D
301	CLAYTON, RICHARD C
333	CLAYTON, ERIC C
395	LOWE, WILLIAM E
396	KAUN, WALTER
397	HUMPHREY, M
501	INGRAM, JOHN E
529	BLAYLOCK, EDWARD P
531	RADER, JERADITH
616	DAY, DAN J
685	FISHER, SANDY A
711	KING, ELLEN E
720	DAY, DAN J
725	BISHOP, DANIEL M
733	OLIVER, PAUL J
745	LAMBERTSON, RACHEL
809	CLINE, GREGORY M
815	GIBSON, LESLIE J
888	DOLPH, EUDORA M
909	ADKINS, ALLEN F
931	KELLER, TONY R
963	WASHINGTON, MICHAEL N

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 2010

3039	NEAL, STACEY R
3105	ANDERSON, MICHELLE
3119	TIDWELL, ANTHONY
3131	GOSE, CHARLES J
3155	TAULBEE, C
3163	WARD, MICHAEL T
3174	BOWLING, LINDA S
3218	OSTRANDER, VINCENT P
3266	AVERY, JESSICA L
	LEAL, YOLANDA
	LYKINS, TIFFANY A
	TENNEY, MAYFORD
	WOOLUMS, BANDY
3294	TAYLOR AUTOMOTIVE
3376	D & D RV & AUTO
3377	PREBLE MEMORY GARDENS
	ROBERT L CROOKS FUNERAL CTR
3398	SIZEMORE, JAMES E
3418	KELLY, JOANNA
3435	SPURLOCK, GENE C
3436	SIMPSON, BILLY J
3457	HAWKINS APPLIANCE REPAIR
3626	BURRIS, BETTY
3637	WASHINGTON, HARLEY L
4042	WARE, JOHN M

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2005

32	ASHLEY, PATRICIA A
	CRAUDER, G
	GILLETTE, RACHELLE
	HEATH, JASON
	KLAPPER, DON
	MORRIS, NANCY J
	NOBLE, IRIS
	PARTLOW, MARILYN A
	PUTERBAUGH, KAREN S
	RALSTON, JOSH
	SMITH, PHYLLIS A
	WARNER, STANLEY F
	WILLEFORD, JANICE M
71	EVANS, SARAH
75	WARNER, MICHAEL
93	HAMMOND, DENNIS D
103	LEIS, JAMES V
115	MARTIN, ANDREW J
117	BAUGHMAN, MARY A
133	DAISY HOUND CREATIONS
	PEMBERTON, JIM L
142	STONER, RICKY I
175	UPCHURCH, TRACEY L
180	GARDNER, DONNA
187	HOLT, CONRAD L
192	ARMSTRONG, RICHARD
207	PEMBERTON, DARRELL L
225	PEMBERTON, GLEN A
234	OHIO DEPARTMENT TRANSPIRATION RD MNT
245	HILL, JEFF A
304	MCKEE, LOWELL L
344	MARTIN, RANDALL A
345	CONLEY, JACK
358	CAROL, ALVIS
378	SUGGS, ROBERT F
379	RICKS, RICHARD
380	THOMAS, AMANDA R
427	KEM, DONALD F
430	LINDSEY, VELMA B
495	WOLTJA, JACK
670	WISE, JOHN C
706	RALSTON, EDWARD R
730	HOWARD, CHARLES
756	BERRY, TIMOTHY J
904	DAVIS, JERRY
1107	DAUGHTERY, DAVID E
1296	MULLINS, TOM
1428	BOBS BODY SHOP
	CLEARMONT, CLAYTON J
	COLLINS, ROBERT L

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2005 (Cont'd)

1551 MILLER, DOUGLAS O
1987 MILLER LAND APPLICATION INC
MILLER, DUANE L
2100 FULTZ, GENE H
2313 BROWN, SONJA
2414 DAVIS, PAUL D
PAUL DAVIS
2615 BRUBAKER, ELLEN A
2767 BRUBAKER, GREG A
2918 BRUBAKER GRAIN & CHEMICAL INC
3130 COUNTRY CABINETS
DUTTER, ANDY L
3320 EMIG, MAE H
3576 BRUBAKER, DARRELL L
3598 DEATON, SHERYL K
3674 MILLER, ROBERT W

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 2005

35	REDS AUTO SALES
36	FLORY, DAVID D
109	WILLIAMS, MARTHA M
131	CHRISTIAN, JERRY K
169	COMBS, HENRY H
239	HALL, SCOTT M
252	BUSCHUR, RAYMOND E
263	HILOEBRANO, KENNETH W
274	KIRECOFE, EILEEN D
301	MARKER, JOSH L
333	CLAYTON, ERIC C
339	BRYAN, SHAWN D
367	HOWARD, KEVIN G
381	MCGUIRE, JUSTIN
385	MCGUIRE, KORD L
501	INGRAM, JOHN E
531	LEWIS, CHARLES E
616	DAY, DAN J
685	GRAY, JULIE A
711	KING, ELLEN E
720	DAY, DAN J
725	PHILLIPS, CASSONDRA
733	OLIVER, PAUL J
761	MOLES, CAROLYN S
809	CARMACK, JAMES E
888	DOLPH, EUDORA M
909	ADKINS, ALLEN F
931	KELLER, TONY R
963	WASHINGTON, MICHAEL N
983	BAKER, TED C
1037	BAKER, EARL J

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 2005

3009	WALL, TOM
3039	COLE, STANLEY
3046	DAVIS, R
3088	OLIVER, LARRY K
	PIERCE, LEE A
3119	MIZE, CRAIG
3131	GOSE, CHARLES J
3138	MILLER, VEARL
3153	COLE, MARTY L
3157	COLE, JUNIUS
3218	OSTRANDER, VINCENT P
3239	BENNINGFIELD, COLUMBUS
3266	DULGAIAN, JASON
	SEPTEMBER, BANDY
3288	RODEFFER, SAMUEL A
3294	TAYLOR AUTOMOTIVE
3376	D & D RV AND AUTO
3377	BARNES FUNERAL HOMES
	PREBLE MEMORY GARDENS
	ROBERT L CROOKS FUNERAL CENTER
3398	SIZEMORE, JAMES E
3434	CLARK, JOHNNIE
3435	SPURLOCK, GENE C
3436	HARRIS, JENNIFER L
3457	COUNTRY CHICKEN STORE
3626	BURRIS, BETTY
3640	HICKEY, ELLEN C
3642	MARCONETT, ANGELA
3666	STEVENS, N
4042	MORROW, GERALDINE

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 2000

31	SHANK, DANIEL
32	ALVEY, DONALD D
	HALE, DAVID
	MORRIS, NANCY
	PUTERBAUGH, LISA
	YOUTSEY, DONALD L
71	CULVER, BRIAN
93	ROBERTSON, STEVEN
115	MARTIN, ANDREW J
117	BAUGHMAN, MARY A
133	PEMBERTON, JIM
137	PEMBERTON, J L
142	STONER, DONALD E
160	MILLER, EDNA
175	A W ASHLEY CONSTRUCTION
180	EDWARDS, JAMES
207	IRELAND, FRANCES J
	PEMBERTON, LUTHER H
234	OHIO STATE OF TRANSPORTATION DEPARTMENT
245	HILL, TERESA D
304	MCKEE, LOWELL
378	SUGGS, ROBERT E
427	KEM, DONALD
430	LINDSEY, WALTER F
495	WOLTJA, JACK
649	HESTER, MICHAEL
706	RALSTON, EDWARD
716	RALSTON, RALPH E
730	HOWARD, CHARLES
756	FISHER, VIVIAN J
766	EDY, MICHAEL
904	DAVIS, JERRY
1107	DAUGHERTY, DAVID
1296	MULLINS, TOM
1428	COLLINS, ROBERT L
1456	LESH, DAVID
1551	MILLER, DOUGLAS O
1987	MILLER, DUANE L
2100	FULTZ, GENE H
2313	BROWN, SONJA
2615	BRUBAKER, ELLEN
2918	BRUBAKER GRAIN & CHEMICAL
3130	DUTTER, GALEN
3320	ZETTEE, WILLIAM S
3576	RUBAKER, REUBEN
3578	BRUNK, REBECCA I
3598	FISHER, LOLA K
3674	MILLER, ROBERT S
3700	MILLER, EUGENE R

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 2000

109	WILLIAMS, MARTHA J
131	MARCUM, RICK
169	COMBS, HENRY H
252	BUSCHUR, RAYMOND
274	KIRACOFE, E
301	CLAYTON, RICHARD C
333	CLAYTON, ERIC
367	HOWARD, KEVIN G
395	ARMSTRON, RICHARD
	MCGUIRE, KORD
501	INGRAM, JOHN E
531	MARCUM, JOHN
616	DAY, DAN
665	HART, RONALD M
685	HARTLEY, DONALD E
711	KING, ELLEN
725	ELAM, ALLEN L
730	DAY, DAN
733	OLIVER, PAUL J
761	MOLES, CAROLYN S
809	CARMACK, JAMES E
815	BARNES, SAM L
888	DOLPH, EDWARD J
931	KELLER, KIM
963	WASHINGTON, MICHAEL
983	BAKER, TED C
1037	BAKER, EARL J
1090	CREECH, ROBERT L

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 2000

3039	COLE, STANLEY
3046	WICKER, SHIRLEY J
3074	SARVER, MICHAEL
3088	OLIVER, LARRY
3105	PEASE, RICK
3119	ASHLEY GREEN
	GRUBBS, LORA E
3138	MILLER, VEARL M
3157	COLE, JUNIUS
3163	WARD, MARVIN L
3266	BELCHER, LUKE A
3288	RODEFFER, SAM
3294	TAYLOR AUTOMOTIVE
3376	D & D RV AND AUTO
3377	PREBLE MEMORY GARDENS
3398	SIZEMORE, JAMES E
3418	MCCOY, FRED
3434	REYNOLDS, BARB
3435	SPURLOCK, GENE C
3436	REAM, GEORGE
3457	COUNTRY CHICKEN STORE
3637	WASHINGTON, HARLEY
3640	HICKEY, JACK
4042	MORROW, G
	WARE, JOHN M

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 1995

31	SHANK, DANIEL
32	COMBS, LORA
	KLAPPER, DON
	MELLING, KEVIN J
	MILLER, GERALD
	MORRIS, NANCY
	NOBLE, IRIS
	OGLES, MELVIN R
	REECE, DARRELL J
	SHANK, DAN
	THOMAS, CANDY
	WILLEFORD, JANICE
71	MOSS, DAVID A
75	OCCUPANT UNKNOWNN
77	OCCUPANT UNKNOWNN
79	SHAFFER, PAUL R
93	MANLEY, MICHAEL E
115	MARTIN, ANDREW J
117	BAUGHMAN, MARY A
133	OCCUPANT UNKNOWNN
137	PEMBERTON, EMMET
142	STONER, DONALD E
160	WARREN, REVA
175	OCCUPANT UNKNOWNN
180	EDWARDS, JAMES
187	PEMBERTON, HARLEY E
190	OCCUPANT UNKNOWNN
192	MEYERS, AMY J
207	OCCUPANT UNKNOWNN
225	PEMBERTON, GLEN A
234	TRANSPORTATION DEPT
239	OCCUPANT UNKNOWNN
245	HILL, TERESA D
304	MCKEE, LOWELL
314	HART, LELAND L
358	ASHLEY, P A
378	SUGGS, ROBERT E
380	THACKER, HARRY
427	KEM, FRED G
430	LINDSEY, WALTER F
495	OCCUPANT UNKNOWNN
511	DOHNER, WARD
649	KRICKENBARGER, DOUG L
706	RALSTON, EDWARD
716	MARKER, THEA
730	STEWART, K
756	BERRY, TIMOTHY
766	OCCUPANT UNKNOWNN
904	HENNING, GERALD
1025	KRICKENBARGER, BYRON

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 1995 (Cont'd)

1107 DAUGHERTY, DAVID
1428 COLLINS, ROBERT L
1551 SELBY ELECTRIC CO
SELBY, DOUGLAS
1987 MILLER, DUANE L
2100 FULTZ HEATING & COOLING
FULTZ, GENE H
2313 WOODS, ROY A
2615 BRUBAKER, E
2767 BRUBAKER, GREG
2918 BRUBAKER GRAIN & CHEMICAL
BRUBAKER, GARY
3130 GARBER, RICHARD O
3150 OCCUPANT UNKNOWNN
3320 EMIG, MAE
3476 MILLER, ROBERT S
3576 BRUBAKER, DARRELL
3578 BRUBAKER, IRA H
3598 DEATON, SHERYL
QUAKER TRACE TRACTOR SVC
3700 MILLER, EUGENE R

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 1995

109	WILLIAMS, MARTHA J
131	MARCUM, RICK
169	COMBS, HENRY H
239	GANT, KAREN
252	BUSCHUR, RAYMOND
263	HILDEBRAND, KENNETH W
274	KIRACOFE, D E
301	HOPKINS, FLEM
367	HOWARD, KEVIN G
501	H & H AUTO SALES
	OCCUPANT UNKNOWNN
531	OCCUPANT UNKNOWNN
616	DAY, DAN
665	SPENCE, RICHARD L
685	HARTLEY, DONALD E
711	KING, ELLEN E
725	PARSLEY, GREG
733	OLIVER, PAUL J
761	MOLES, ROBERT
809	OCCUPANT UNKNOWNN
815	BARNES, SAM L
888	OCCUPANT UNKNOWNN
931	KELLER, KIM
963	HALL, STEVEN
983	BAKER, TED C
1037	BAKER, EARL J

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 1995

3266	FARMER, LEVI
3288	OCCUPANT UNKNOWNN
3294	ULTIMATE CAR SHOP
3326	OCCUPANT UNKNOWNN
3376	D & D AUTO
3377	PREBLE MEMORY GARDENS
3398	SIZEMORE, JAMES E
3418	MCCOY, FRED JR
3434	OCCUPANT UNKNOWNN
3435	WASHINGTON, DAVID
3447	SPURLOCK, GENE C
3457	COUNTRY CHICKEN STORE
3637	WASHINGTON, HARLEY JR
3640	HICKEY, JACK W
4042	MORROW, G

Target Street	Cross Street	Source
✓	-	Cole Information

QUAKER TRACE RD 1992

31	SHANK, DANIEL
32	KISLING, DARRIN
	MORRIS, NANCY
	SHANK, CARTER
71	FUGATE, J K
79	SHAFFER, PAUL R
93	NEWMAN, PHILLIP H
115	MARTIN, ANDREW J
117	BAUGHMAN, MARY A
137	PEMBERTON, EMMET
160	WARREN, REVA
190	PHILLIPS, PAUL E
192	WHICKER, S D
234	OH ST TRANS HWY
304	MCKEE, LOWELL
325	MCTEER, KIMLOE W
326	MARKER, DEAN
378	SUGGS, ROBERT E
380	THACKER, HARRY
427	KEM, FRED G
430	LINDSEY, WALTER F
511	DOHNER, WARD
538	CRIPPS, MOZELLA
716	RALSTON, EVELYN L
1025	KRICKENBARGER, BYRON
1156	LESH, M
1551	SELBY ELECTRIC CO
	SELBY, DOUGLAS
1987	MILLER, DUANE L
2100	FULTZ, GENE H
2313	WOODS, ROY A
2615	BRUBAKER, E
2767	BRUBAKER, GREG
2918	BRUBAKER GRAIN&CHEM
	BRUBAKER, GARY
3130	GARBER, RICHARD O
3150	GARBER, OSCAR J
3210	FRITTS, JANET
3320	BRUBAKER, GALEN
3476	MILLER, ROBERT W
3576	BRUBAKER, IRA H
3598	QUAKER TRACE TRACTR
3700	MILLER, EUGENE R

Target Street	Cross Street	Source
-	✓	Cole Information

QUINN RD 1992

109	CREECH, ROBERT A
131	MARCUM, RICK
239	OSWALT, S
252	BUSCHUR, RAYMOND
263	HILDEBRAND, KENNETH W
274	KIRACOFE, JAMES A
301	CLAYTON, RICHARD C
367	CAIN, KEITH
501	HAKE, GARY
531	EDWARDS, WILLIAM
685	HARTLEY, DONALD E
725	GIBBONS, DALE T
730	DAY, DAN JR
761	MOLES, ROBERT
809	CARMACK, JAMES E
815	BARNES, SAM L
888	DOLPH, EDWARD J
931	KELLER, KIM
983	BAKER, TED C
1037	BAKER, EARL J

Target Street	Cross Street	Source
-	✓	Cole Information

US ROUTE 35 E 1992

3288	SNYDER, BOB
3294	ULTIMATE CAR SHOP
3326	LEHMAN, KENNETH
3376	J FIVE INC
3377	PREBLE MEMORY GRDNS
3398	SIZEMORE, JAMES E
3418	MCCOY, FRED JR
3434	WEBB, M M
3435	WASHINGTON, DAVID
3457	COUNTRY CHICKN STR
3637	WASHINGTON, HARLEY L JR
4042	MORROW, G

ODOT Preble CO

234 Quaker Trace Rd

West Alexandria, OH 45381

Inquiry Number: 7728002.3

August 06, 2024

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

08/06/24

Site Name:

ODOT Preble CO
234 Quaker Trace Rd
West Alexandria, OH 45381
EDR Inquiry # 7728002.3

Client Name:

Resource International
6350 Presidential Gateway
Columbus, OH 43231
Contact: Kristy Engel-Shepard

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Resource International were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 1644-4786-A0D7

PO # 24-B001

Project ODOT Preble Co

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 1644-4786-A0D7

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

The Sanborn Library LLC Since 1866™

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ODOT Preble CO

234 Quaker Trace Rd

West Alexandria, OH 45381

Inquiry Number: 7728002.8

August 07, 2024

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

08/07/24

Site Name:

ODOT Preble CO
234 Quaker Trace Rd
West Alexandria, OH 45381
EDR Inquiry # 7728002.8

Client Name:

Resource International
6350 Presidential Gateway
Columbus, OH 43231
Contact: Kristy Engel-Shepard

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Search Results:

Year	*Scale*	*Details*	*Source*
2019	1"=500'	Flight Year: 2019	USDA/NAIP
2015	1"=500'	Flight Year: 2015	USDA/NAIP
2011	1"=500'	Flight Year: 2011	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2000	1"=500'	Flight Date: October 20, 2000	USGS
1994	1"=500'	Acquisition Date: April 01, 1994	USGS/DOQQ
1988	1"=500'	Flight Date: April 09, 1988	USGS
1984	1"=500'	Flight Date: May 16, 1984	USDA
1979	1"=500'	Flight Date: November 17, 1979	USGS
1974	1"=500'	Flight Date: May 01, 1974	USGS
1959	1"=500'	Flight Date: November 21, 1959	USGS
1952	1"=500'	Flight Date: September 16, 1952	USGS
1948	1"=500'	Flight Date: September 01, 1948	USGS

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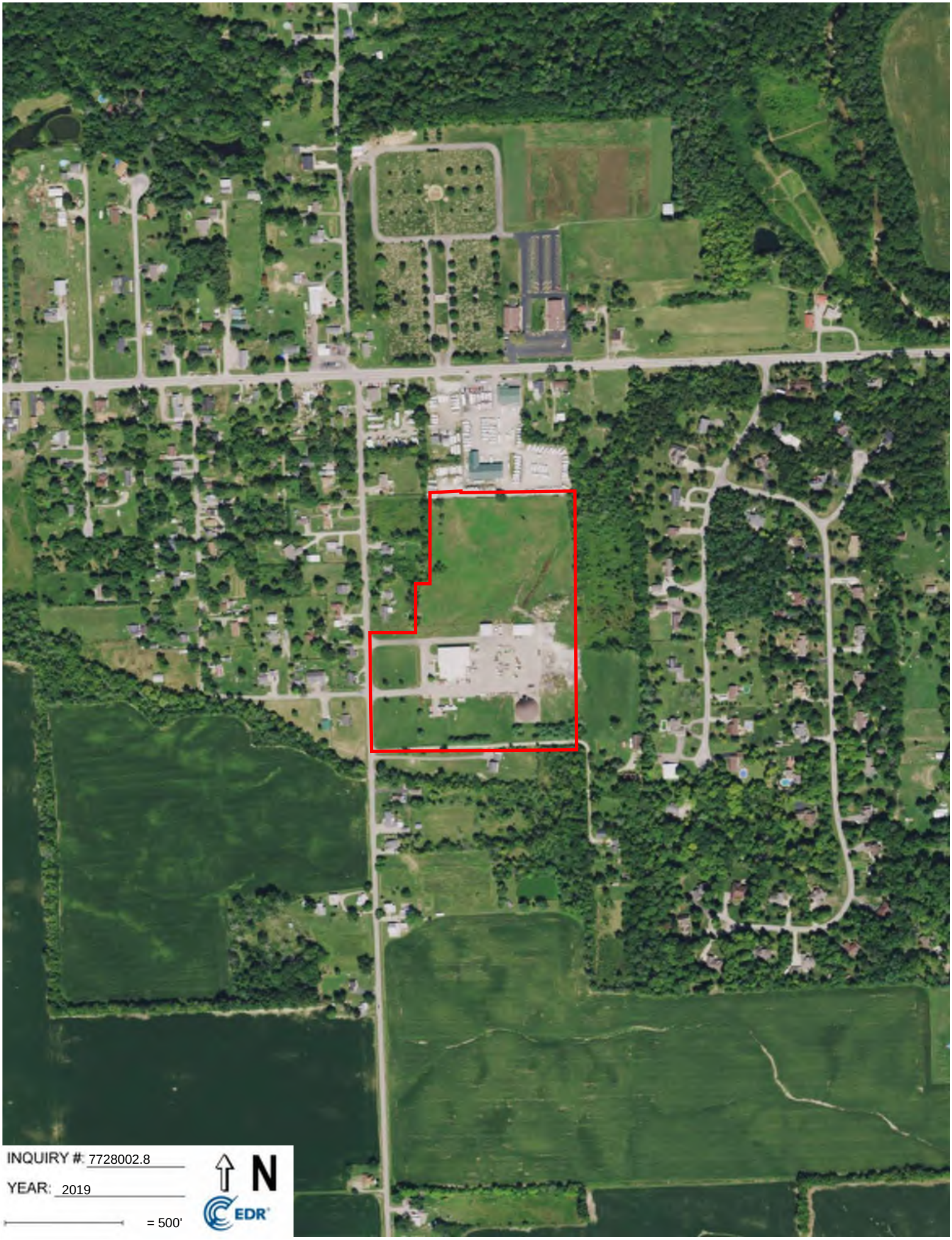
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YEAR: 2015
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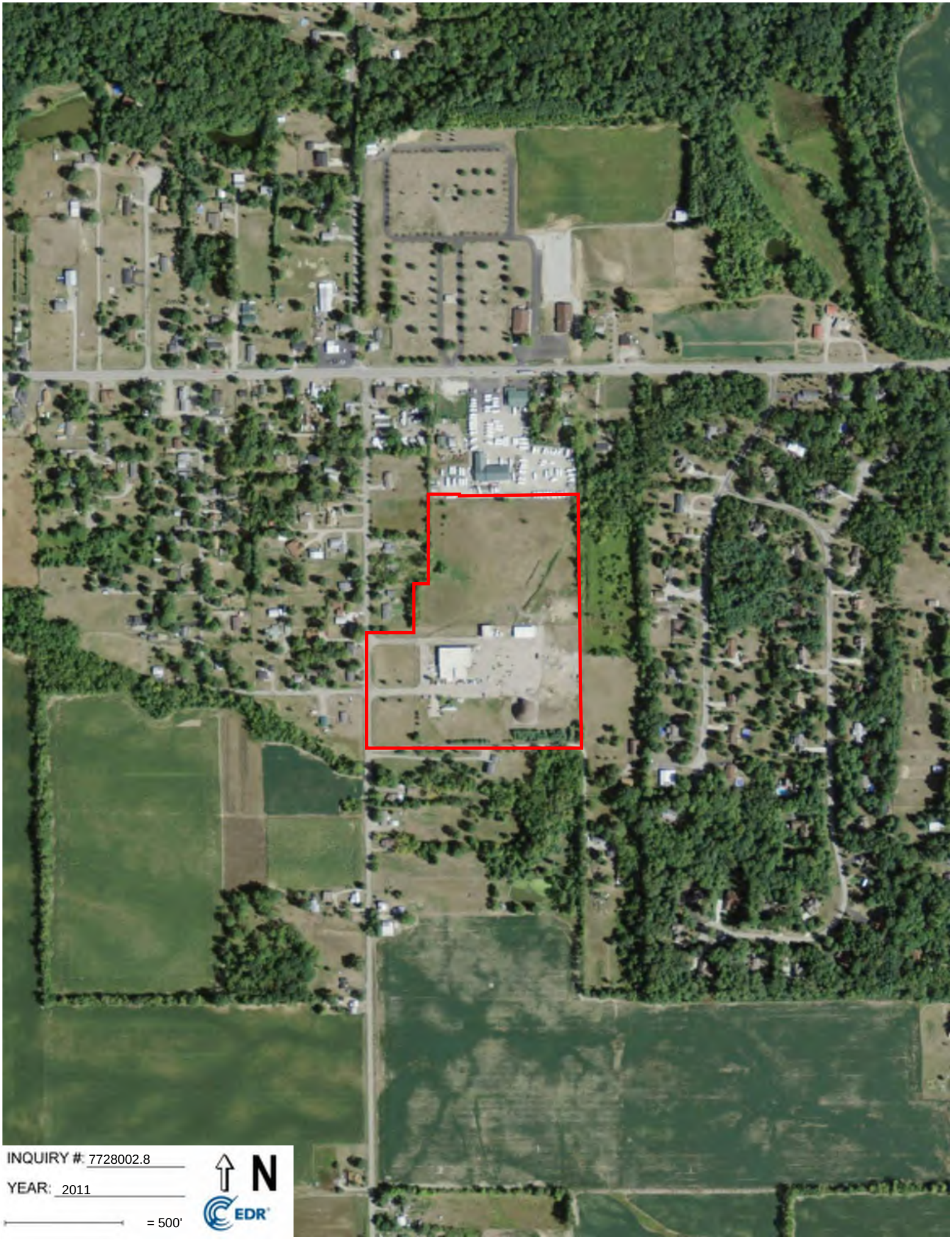
EDR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EDR

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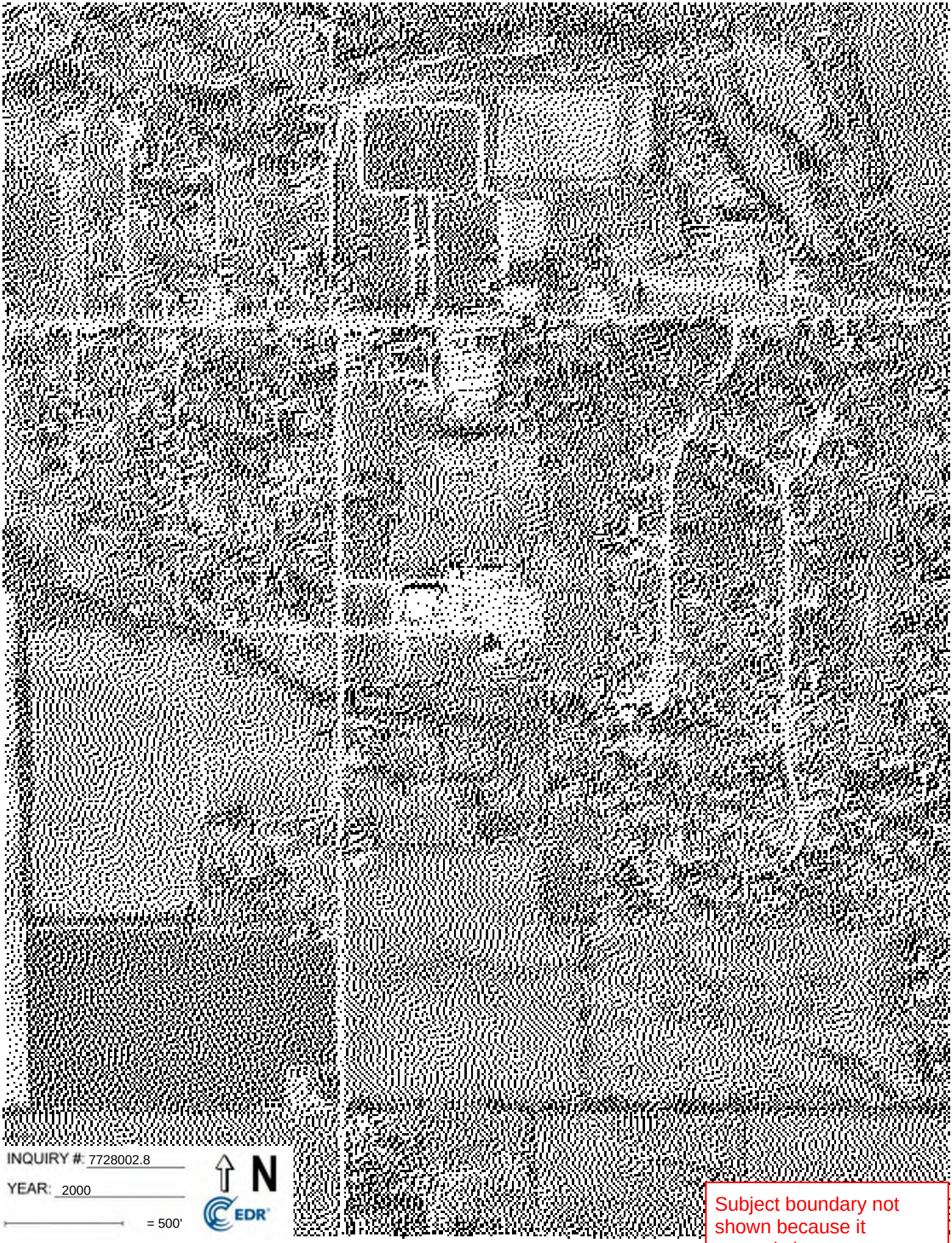
EDR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EDR
Subject boundary not shown because it exceeds image extent or

INQUIRY #: 7728002.8

YEAR: 1988

= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or

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EDR

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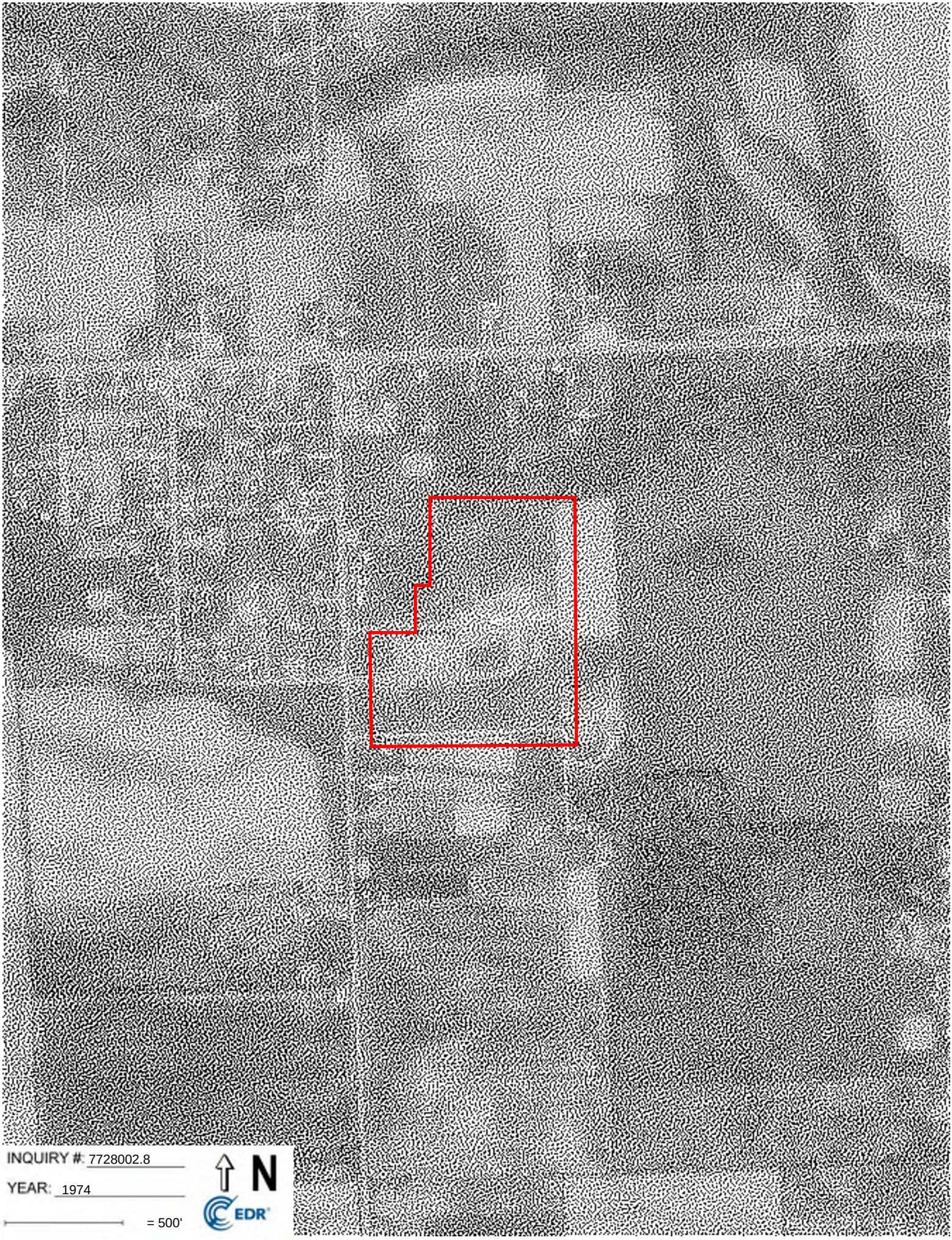
EDR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EDR

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YEAR: 1959
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EDR

INQUIRY #: 7728002.8
YEAR: 1952
= 500'
N
EDR

INQUIRY #: 7728002.8
YEAR: 1948
= 500'
N
EDR

APPENDIX G

INTERVIEW RECORDS

Kristy Engel-Shepard

From: Kristy Engel-Shepard
Sent: Tuesday, August 6, 2024 3:35 PM
To: 'jglander@westalexfire.org'
Subject: Records Request for Environmental Site Assessment

Hello-

Resource International, Inc. is conducting a Phase I ESA for the following property in West Alexandria:

ODOT Maintenance Facility
234 Quaker Trace Road
Parcel No. H2553051000001700

We are currently trying to locate any underground storage tank permits, fire responses, environmental complaints, or spills on or around the property. I would appreciate it if you could view your current and historical records for information.

Thank you for your time.

Kristy Engel-Shepard – Environmental Project Manager
Resource International Inc.
6350 Presidential Gateway | Columbus, Ohio 43231
Phone: 614.823.4949 ext. 2079 | Fax: 614.823.4990 | Cell: 614.506.0287
Direct Line: 614.797.9539

Preble County Public Health
615 Hillcrest Drive
Eaton, Ohio 45320

Questions? Need to schedule an Immunization?
Call us during business hours at 937-472-0087 .

- Environmental Health, Plumbing, Sewage, Water or Food Permits - PRESS 2
- Nursing Division, including Immunizations, BCMH, and Clinic - PRESS 3
- Birth and Death Certificates - PRESS 4
- Car Seats - PRESS 5
- WIC - PRESS 6
- Administration - PRESS 7

Or fill in the following form and one of our staff will get back to you:

Kristy Engel-Shepard

kristye@resourceinternational.com

6148234949

Records Request

Resource International is conducting an Environmental Site Assessment for the ODOT Facility located at 234 Quaker Trace Road in West Alexandria. We are requesting any records on environmental complaints or spills on the property. Thank you

Send

Kristy Engel-Shepard

From: Angie Willard <angie@preblecountyhealth.org> on behalf of Angie Willard
Sent: Tuesday, August 6, 2024 5:51 PM
To: kristye@resourceinternational.com
Subject: Records Request

I am sorry, we do not have any complaints or spills on this property.

Angie Willard
Preble County Public Health
615 Hillcrest Drive
Eaton, Ohio 45320
P:937-472-0087

Kristy Engel-Shepard just submitted your form: Contact on pcph

Message Details:
Name: Kristy Engel-Shepard
Email: kristye@resourceinternational.com
Phone: 6148234949
Subject: Records Request
Message: Resource International is conducting an Environmental Site Assessment for the ODOT Facility located at 234 Quaker Trace Road in West Alexandria. We are requesting any records on environmental complaints or spills on the property. Thank you.

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RESOURCE INTERNATIONAL, INC
6350 Presidential Gateway
Columbus, Ohio 43231
614-823-4949 Phone
614-823-4990 Fax

PHASE I ESA
USER QUESTIONNAIRE

Subject Site: Preble County Full Service Garage ODOT

Address: 234 Quaker Trace Road

City: West Alexandria State: Ohio Zip: 45381

Township/County: Lanier/Preble

Information Provided by: Scott Shuler TA ODOT Preble County Date: 9/5/2024

Representing: ODOT Telephone: 513-933-6141

1. Current and historic use of the property: ODOT full service mainteance facility.

2. Are chemicals handled, stored, or consumed on-site? Have they been in the past?
Yes

3. Have any underground or aboveground storage tanks been present on-site?
Above Ground Fuel Tanks Diesel and Unleaded

PLEASE ANSWER THE FOLLOWING QUESTIONS:

YES	NO	
☐	☒	**1. Environmental cleanup liens filed or recorded against the site:** *Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law?*
☐	☒	**2. Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry:** *Are you aware of any activity and use limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?*

RESOURCE INTERNATIONAL, INC
6350 Presidential Gateway
Columbus, Ohio 43231
614-823-4949 Phone
614-823-4990 Fax

PHASE I ESA
USER QUESTIONNAIRE

3. Specialized knowledge or experience of the person seeking to qualify for the Landowner Liability Protections (LLPs):

☐	☒	*As the user of the ESA do you have any specialized knowledge or experience related to the property or nearby properties?*
☐	☒	*For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by the type of business?*

4. Relationship of the purchase price to the fair market value of the property if contaminated:

☐	☒	*The purchase price being paid for this property does <u>not</u> reasonably reflect the fair market value of the property?*
☐	☒	*If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property*

5. The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation:

☐	☒	*Based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of contamination at the property?*

6. Commonly known or reasonably ascertainable information about the property:

☐	☒	*(a) Do you know the past uses of the property?*
☒	☐	*(b) Do you know of specific chemicals that are present or once were present at the property?*
☐	☒	*(c) Do you know of spills or other chemical releases that have taken place at the property?*
☐	☒	*(d) Do you know of any environmental cleanups that have taken place at the property?*

If the answer is "yes" to any of the above questions, further explanation and pertinent documentation should be provided to the environmental professional.

<u>PERSON COMPLETING THIS PHASE I ESA QUESTIONNAIRE:</u>

Scott Shuler TA ODOT Preble County

		9-5-2024
Print Name	**Signature**	**Date**

Page 2 of 2 Question 6 (b) List provided to Zack Hamilton, Katie Bossert for Resource International during building walk through.

APPENDIX H

QUALIFICATIONS OF PROFESSIONALS

Kristy Engel Shepard, MS

Senior Environmental Specialist
Project Manager
Senior Asbestos Inspector

Education:

Master of Science in Environmental Management, University of Findlay, Ohio, 1996
Bachelor of Science in Environmental Science, Eckerd College, St. Petersburg, Florida, 1994

Registrations

Ohio Certified Asbestos Evaluation Specialist, ES34846
Ohio Certified Asbestos Hazard Abatement Project Designer, PD60776
Asbestos Inspector #19A001361 (Indiana Dept. of Environmental Management)
Asbestos Management Planner #19A001362 (Indiana Dept. of Envrionmental Management)
Ohio Certified Lead Risk Assessor, LA9350
CESSWI, #3502 Certified Erosion, Sediment and Storm Water Inspector

Years of Experience: 24
With Rii since: 2006

Summary of Experience:

Ms. Engel is an environmental scientist and hazardous material associate. Her environmental site assessment experience includes asbestos, lead paint, PCBs, mercury, site reconnaissance, historical records review and review of applicable regulations to evaluate site conditions relative to federal, state and local environmental laws and regulations. She has conducted historical reviews following FCC/NEPA and NHPA Section 106 review processes and has performed Phase I and Phase II Environmental Site Assessments for commercial and industrial properties, in accordance with ASTM Standards, ODOT standards, and various client specifications throughout the states of Ohio, Kentucky, Indiana, Colorado, and Pennsylvania.

Ms. Engel has performed removal and closure activities for underground storage tanks (USTs) under BUSTR guidelines and has completed the closure forms and necessary paperwork. She has also conducted Phase I and II ESAs in accordance with the Ohio EPA Voluntary Action Program (VAP) under the guidance of a Certified Professional.

Project Experience:

Murray Hall, Phases I and II, The Ohio State University, Columbus, Ohio - Ms. Engel was responsible for the asbestos surveys completed in September 2008. Phase I of this project includes the renovation of the first and second floors of Murray Hall, located on the OSU Medical Campus. These improvements include the implementation of a concept plan and program of 18,000 s.f., assignable space; plus supporting systems, for Behavioral Medicine Research. Phase II involves the renovation of the third floor of Murray Hall, approximately 15,894 gross SF, to accommodate Behavioral Medicine Research.

Phase II Environmental Site Assessment, Eastern Avenue & Delta Avenue Sewer Separation – Metropolitan Sewer District of Greater Cincinnati, Ohio - Eight soil borings/monitoring wells were installed to evaluate the potential of petroleum contaminant to be encountered within the proposed sewer alignment. The monitoring wells were

installed to approximate depths of 30 feet in order to determine if contamination exists in the groundwater.

Phase II Environmental Site Assessment, Private Automobile Dealership – Akron, Ohio – Five soil borings were installed to an approximate depth of 18 feet in order to delineate the horizontal and vertical extent of petroleum contamination. It was determined through the analytical results that the contamination originated from former underground hydrualic lifts.

Baldwin Residuals and Fairmont Reservoir Hazardous Material Investigation and Survey, City of Cleveland, Ohio – Environmental Specialist for hazardous material survey which included the assessment of the presence of asbestos-containing materials, lead-based paint, mercury and PCB-containing lighting and equipment, and any other miscellaneous materials indentified during the site work. The purpose of the engineering project was to rehabilitate the Baldwin Water Treatment's existing residuals handling and storage facilities, demolish the existing raw water reservoir, demolish the existing Chemical Building, provide a hazardous waste storage facility, construct new storage tanks and modify the recycle handling process.

City of Columbus Fleet Management Service Garage (475 Short Street) BUSTR Tier 1 Evaluation and Delineation, Columbus, Ohio – Environmental Specialist for a multi phase BUSTR Tier I Investigation and subsequent delineation that was completed of the City of Columbus fuel station located at the Fleet Management facility. The city removed two 10,000-gallon USTs, one 8,000-gallon UST nested together, and a 1,000-gallon UST located separately on the site. It was determined during the removal the largest UST had leaked. Rii determined under a BUSTR Tier 1 Evaluation that the tank leaked outside of the UST cavity and migrated across the property. Rii delineated the petroleum contaminant plume from the UST and concurrently identified a historical buried fuel line leak resulted in a large petroleum contaminant plum that had migrated beyond the property.

City of Hilliard, Ohio – Conducted bi-weekly Temporary Sediment Erosion Control (TSEC) inspections of the 17 construction projects performed throughout an entire year. Project entailed conducting the inspections, documentation, and communicating with the contractors to follow-up on necessary repair or installation of the sediment and erosion control measures.

Asbestos Clearance Sampling, Baldwin Water Treatment Plant – Cleveland, Ohio
Conducted Asbestos Clearance Sampling to ensure that the regulated area was adequately cleaned and that airborne asbestos concentrations were at or below 0.01 fibers per cubic centimeter (f/cc) of air. Based on the results of analysis, the regulated area was deemed suitable for occupancy/demolition.

BUSTR Tier I Evaluation, City of Columbus, Public Services Department, Columbus, Ohio – In the process of completing a BUSTR Tier I Evaluation of the City of Columbus maintenance facility. The investigation included soil sampling of 12 borings and obtaining water samples from monitoring wells installed in each boring. The Tier 1 Source Investigation determined that the chemicals of concern (COC) exceeded the appropriate BUSTR designated action levels (AL). Therefore, as per the BUSTR requirements for detected COC above the AL, a Tier 1 Delineation investigation was recommended for the site. Once the Tier 1 Delineation defines the horizontal and vertical extent of contamination, remediation will be required.

BUSTR Tier I & II Evaluations, City of Bedford Heights, Ohio – Conducted a BUSTR Tier I Evaluation in conformance with the scope and limitations of the American Society for Testing and Materials Standard Guide for Environmental Site Assessment (ASTM) Practice D 1586 and Bureau of Underground Storage Tank Regulation (BUSTR) 1999 Corrective Action Guidelines. Both soil and water samples were obtained and analyzed. Based on the findings of the Tier I, the detection levels of the analytical results for the soil and water samples were above the BUSTR action levels. Therefore, it was concluded that further testing would be necessary. Rii recommended to the City of Bedford Heights, per BUSTR, that additional testing would need to be completed by completing a Tier II investigation. The Tier II field investigation has been completed and the laboratory results have been submitted. BUSTR has requested additional sampling to further delineate the subsurface contamination. Once the extent of contamination is delineated, the Remedial Action Plan will be submitted to BUSTR and the Petroleum Underground Storage Tank Release Compensation Fund (PUSTRB) for approval.

Phase I ESA, Summa Health Systems, Akron, Ohio – Conducted several Phase I Environmental Site Assessments in conformance with ASTM Practice E 1527-05 in order to identify evidence of recognized environmental conditions (RECs) in connection with the properties. The Phase I ESAs included a records review, site reconnaissance, interviews, and an evaluation of the properties in order for the user to qualify for the innocent landowner defense under the Comprehensive Environmental Response and Liability Act (CERCLA).

Phase I ESA, Daly Road Sewer Project, Greater Cincinnati Metropolitan Sewer District, Cincinnati, Ohio – Performed a Phase I ESA of the approximate 4,500-linear feet project of Daly Road for a new sewer. The project included providing an environmental assessment of 119 parcels and conducting a Phase II ESA of a commercial gas station.

Training & Certifications:

- Certified Professional in Erosion and Sediment Control (CPESC) Exam Review Course, September 2007
- Asbestos Building Inspector Initial Training, March 2007
- Asbestos Management Planner Initial Training, March 2007
- Permit Required Confined Space Entry Training, CFR 1919.146, 2009
- XRF Instrument Safety Training, Innov-X Systems, 2009
- Ohio Department of Transportation Categorical Exclusion (CE) Training – 2004
- Health & Safety Training for Hazardous Waste Operations and Emergency Response, October 2001
- Cell Towers, Co-location and Section 106 – January 2002
    - Hosted by the State Historic Preservation Office at the Ohio Historical Center
- Tool & Tactics for Enhancing Project Management – March 2002
    - Hosted by the DPIC Companies
- Health & Safety Training for Hazardous Waste Operations, OSHA 40-hour & 8-Hour Refresher
- Red Cross First Aid/Adult CPR

Katie Bossert – Environmental Specialist

Education:

Bachelor of Arts in Biology, University of Florida, 2022
Master of Science in Geological Sciences, Ohio University, 2023

Years of Experience: 2
With Rii Since: 2023

Training and Certifications:

Ohio Certified Asbestos Evaluation Specialist, ES549481
Permit Required Confined Space
American Red Cross First Aid/CPR
OSHA 40-Hour Health and Safety Training Course for Hazardous Waste Operations
ODOT Office of Environmental Services – Regulated Materials Review 100, 200, and 300

Bio:

Ms. Bossert has more than 2 years of environmental assessment and hazardous waste experience. She is proficient in Phase I Environmental Site Assessments (ESAs), hazardous materials surveys for asbestos and lead-based paint, and also inspects groundwater, surface water, and soils.

Project Experience:

Phase I & II ESAs, City of Cincinnati Mill Creek Wastewater Treatment Plant, Cincinnati, Ohio – conducted Phase I and II ESAs as part of the High-Rate Treatment Pump Station project for the Metropolitan Sewer District of Greater Cincinnati. The Phase I ESA was conducted for over 75 acres on the Mill Creek Wastewater Treatment Plant. The Phase II ESA included the development of 20 environmental borings to a maximum depth of 50 feet.

Ohio EXPO Center & State Fairgrounds, Wellogy Design, Columbus, Ohio – Conducted a Hazardous Materials Assessment as part of the Ohio Expo Center Phase 1 Implementation project which involves the demolition of five (5) buildings.

Former Power Building, Cincinnati, Ohio – Conducted a PCBs and Hazardous Materials Assessment for a former Power Building at a wastewater treatment plant. Bulk samples of paint, liquid and sludge were collected and analyzed for the presence of PCBs. In addition, suspect asbestos-containing materials were sampled and analyzed for a future renovation project.

City of Columbus Fourth Water Plant, Delaware County, Ohio – Conducted soil, groundwater and surface water sampling at the location of the future City of Columbus Fourth Water Plant.

Asbestos Survey of Residential Dwelling, Franklin County, Ohio – Conducted an asbestos survey of a former residential structure that was partially destroyed by fire. The scope of work included

assessing suspect asbestos-containing materials at the structure that may be disturbed by the proposed demolition.

Phase I ESA, East Branch Ohio Interceptor Extension Project, Cincinnati, Ohio – conducted a Phase I ESA as part of a combined sewer system improvement project for the Metropolitan Sewer District of Greater Cincinnati. The project area consisted of 48 acres and is located in a mixed commercial/industrial area.

Phase I ESA, City of Columbus Recreation and Parks Department, Columbus, Ohio – conducted a Phase I ESA for 3 parcels of land for the City of Columbus Recreation and Parks Department prior to acquisition of the property. The property included one structure equaling approximately 7,228 square-feet, a parking lot, and a vacant-grass covered area.

Michelle L. Eckels, CPG, LEED Green Assoc.

Vice President – Environmental Services

Education:

Bachelor of Science in Geological Sciences, The Ohio State University, Columbus, Ohio 1993

Registrations:

- Certified Professional Geologist, Certification #CPG-11164
- LEED Green Associate, Green Building Certification Institute (GBCI), #10782030
- Certified Asbestos Hazard Evaluation Specialist, State of Ohio, Certification #33141
- Certified Asbestos Hazard Abatement Project Designer, Certificate #60600
- American Institute of Professional Geologists (AIPG) Member, #0409

Years of Experience: 26 With Rii since: 1995

Certifications and Training:

- 38-Hour Army Corps of Engineers Wetland Delineation and Management Training Program
- BUSTR 2012 Release Prevention Seminar
- ODOT Office of Environmental Services (OES), Ecological Training, March 2006
- ODOT OES, Waterway Permits, February 2006
- US Fish and Wildlife Service, Endangered Species Consultation in Ohio Workshop, November 2005
- Permit Required Confined Space Entry Training, CFR 1919.146
- Analysis and Design of Aquifer Tests Training, National Ground Water Association
- OSHA 40-Hour Health and Safety Training Course for Hazardous Waste Operations
- Radiation Safety Training
- 36-Hour Certified Tank Installer/Removal Training Program, US Training and Safety Institution
- ASTM Risk-Based Corrective Action Training Program
- Prequalified with the Ohio Department of Transportation (ODOT) to conduct ODOT Environmental Screenings, and Phase I and II ESAs
- Prequalified with Huntington Bank to conduct Phase I and II ESAs, Asbestos Surveys, and Wetland Delineations
- XRF Instrument Safety Training, Innov-X Systems, 2009

Summary of Experience:

As Director of Rii's Environmental Services Division, Ms. Eckels' responsibilities includes business development, technical proposal development, contract negotiations, project management, and client and regulatory agency meetings. Ms Eckels's provides project management and supervision of services including environmental site assessments (Phase I and II ESAs), asbestos and lead surveys, hydrogeologic investigations, wetland delineations and ecological surveys, leaking underground storage tank closure and remediation, construction storm water sediment and erosion control plans and weekly inspections and environmental drilling projects.

Ms. Eckels' knowledge of hydrogeology has expanded Rii's scope of services to include hydrogeological site investigations and aquifer analyses. Ms. Eckels has conducted hydrogeological site investigations for analysis of aquifer characteristics interpreted from slug and pumping test, soil boring information and study of reference materials.

Ms. Eckels has completed wetland determinations and delineations, and has prepared Section 401/404 permits required to develop within wetland areas. Ms. Eckels has performed wetland delineations prior to real estate transactions, site deveopment and Section 401/404 permitting to identify and provide a preliminary evaluation of the number, size, and quality of any wetlands present on parcels of concern. These wetland delineations have been performed in accordance with the US Army Corps of Engineers three-parameter (vegetation, hydrology, and soils)

wetland delineation methodology, and completing the applications to obtain a nationwide or individual wetland permits.

Site Assessment and Hazardous Materials Services

Baldwin Residuals and Fairmont Reservoir Hazardous Material Investigation and Survey, City of Cleveland, Ohio – Environmental Project Manager for hazardous material survey which included the assessment of the presence of asbestos-containing materials, lead-based paint, mercury and PCB-containing lighting and equipment, and any other miscellaneous materials indentified during the site work. The purpose of the engineering project was to rehabilitate the Baldwin Water Treatment's existing residuals handling and storage facilities, demolish the existing raw water reservoir, demolish the existing Chemical Building, provide a hazardous waste storage facility, construct new storage tanks and modify the recycle handling process.

Phase I ESAs

Conducted more than 70 Phase I ESA of developed and non-developed properties so that the client may qualify for the innocent landowner defense to CERCLA liability.

CSO #125, MSDGC, Cincinnati, Ohio – *Environmental Project Manager*. As part of the CDM project team, Michelle is providing environmental assessment, surface water assessment and 401/404 permitting assistance. The Phase I ESA included (10) properties, consisting of twenty two (22) parcels in the project area. The purpose of the overall project scope of work is the completion of technical services tasks related to planning the project to remove stormwater and stream inflow from the combination sewer.

Famicos Foundation Sites, Cleveland, Ohio - Completed Phase I ESAs of 29 properties included in a low-income housing revitalization project within the inner city Cleveland, Ohio area. In addition to the ESA, asbestos surveys were performed at several severely dilapidated houses or apartments in the project.

Youngstown Correctional Institution, Youngstown, Ohio - Conducted a Phase I ESA and Updated Phase 1 ESA of the 105-acre Youngstown Correctional Institution in Youngstown, Ohio. The project required good communication when on-site in order to meet the Phase I ESA requirements without infringing on security.

CarMax Dealerships, Columbus, Ohio - Performed a Phase I ESA of a 12.9-acre heavily wooded site for a proposed auto dealership in Columbus, Ohio. Much of the site was undeveloped, adjacent to a major stream, and within a 100-year floodplain.

National Industrial Lumber Company, Columbus, Heath, Hebron, Ohio - Conducted three (3) Phase I ESAs of industrial sites for a client seeking a property to relocate a lumber distribution company. The properties were all adjacent to railroad tracks and within predominately industrialized areas.

Gordon Food Service Marketplace, Ohio and Kentucky - Completed five Phase I ESAs, including an asbestos survey and wetland determination, of proposed sites for the development of a Gordon Food Service Marketplace store. Sites have been in Ohio and Kentucky.

Phase II ESAs

Morse Road Widening Project, Columbus, Ohio - Project lead for conducting an invasive environmental investigation of nine sites for the Morse Road Widening Project in Columbus, Ohio. Sites included former or existing gas stations with a known or suspected leaking underground storage tanks.

Saint Vincent Charity Hospital, Cleveland, Ohio - Performed an invasive soil and groundwater environmental investigation at the Saint Vincent Charity Hospital of Cleveland in Cleveland, Ohio. Impacts to the property from a former on-site underground storage tank (UST) that was suspected to have leaked and from underground storage tanks known to have leaked on adjacent properties were investigated during the assessment. Conducted soil and groundwater sampling using Geoprobe equipment.

Northeast Ohio Regional Sewer District (NEORSD), Cleveland, Ohio - Completed an invasive soil and groundwater environmental investigation of an existing sewer outfall maintained and operated by the NEORSD in Cleveland, Ohio. The project objectives was to determine if contaminates from adjacent properties in three directions known to have released contaminates into the aquifer have leached around the sewer lines.

Easton Development, Columbus, Ohio - Project lead on a Phase II ESA for the Easton Development in Columbus, Ohio. The primary concern of this ESA was potential petroleum contamination from a former above-ground storage tanks.

Belleville West Virginia Hydroelectrical Plant, Belleville, West Virginia - Conducted a Phase II ESA at the Belleville West Virginia Hydroelectric Plant along the Ohio River to assess suspected releases of hydrocarbons into the subsurface soil and aquifer from USTs and surface releases.

East 79th Street Rehabilitation Project, Cleveland, Ohio - Performed an invasive soil and groundwater environmental investigation for the East 79th Street Rehabilitation project in Cleveland, Ohio. The purpose of the project was to determine the presence or absence of hazardous substances and petroleum products of suspect adjacent right-of-way properties.

Jennings Road Rehabilitation/Reconstruction, Cleveland, Ohio - Project Manager for the Environmental Screening and Phase I and II Environmental Site Assessments (ESAs) for the proposed Jennings Road Rehabilitation/Reconstruction Project. Rii initially conducted an Environmental Screening of project corridor and adjacent properties in accordance with the ODOT Environmental Screening Standard. The project corridor was 7,660 linear feet (1.45 miles), totaling 93 properties, within a densely populated commercial and residential area of Cleveland, Ohio. Phase I ESAs were conducted of nine (9) of the properties to evaluated the potential of contamination migration into the right-of-way. A Phase II ESA was also conducted within the right-of-way adjacent to a chemical production, storage, and transportation facility. Rii obtained soil and groundwater samples from three (3) borings utilizing Rii's Geoprobe sampling equipment and retained for further laboratory analysis. Based on the findings of the analysis, Rii provided recommendations to the architect on construction and handling and disposal of contaminated soils.

Preliminary Environmental Investigation, Burke Lakefront Airport, Cleveland, Ohio –
Conducted a preliminary environmental investigation for the Safety Runway Expansion Area project of the Burke Lakefront Airport. The preliminary environmental investigation included a Threatened and Endangered Species database search, an environmental hazardous materials search, wetland/stream investigation and historical use of the property. A report was prepared and submitted to the Port Authority.

Environmental Audit Assistance, Department of Public Utilities, Columbus, Ohio - As part of an audit team, Ms. Eckels conducted data and facility audit tasks as part of an environmental audit of all public utility facilities. As part of Audit Team 3 Rii is performing this task for Trucked Waste Disposal Facility, Fairwood Facility (SMOC), Water Booster Pump Stations (24), Water Tanks (27), Hoover Dam, Dublin Road Public Utilities Facility.

Publications:

- D. Sahagian, M. Jones (Eckels), Quantified Middle Jurassic to Paleocene Eustatic Variations Based on Russian Platform Stratigraphy: Stage Level Resolution. Geological Society of America Bulletin, v. 105, p. 1109-1118, 5 figs., 1 table, August 1993.

- M. Jones (Eckels), Stratigraphic Method of Eustatic Quantifications; a Sea Level Curve Based on Jurassic-Cretaceous Strata of the Russian Platform, Senior Thesis, OSU Geology Library, December 1993.

APPENDIX I

REPORT REFERENCES

REPORT REFERENCES

American Society for Testing Materials Standards on Phase I Environmental Site Assessments for Commercial Real Estate, Designation: E 1527-13 & 21.

Clean Air and Clean Water Acts, 42 USC part 7412 and 33 USC part 1362(7).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA 1980), as amended, 42 USC parts 9601-9657.

Environmental Data Resources, Inc. Report, August 6, 2024.

Ohio Department of Natural Resources, Division of Geological Survey, West Alexandria, OH Quadrangle, Bedrock Topography Map, and Bedrock Geology Map.

Ohio Department of Natural Resources, Division of Water, Preble County Groundwater Well Logs.

Ohio Department of Natural Resources, Division of Oil and Gas, Preble County Oil and Gas Well Logs.

Resource Conservation and Recovery Act, (RCRA 1976), as amended, 42 USC parts 6901-6987.

Solid Waste Disposal Act of 1980, 42 USC part 6921.

Superfund Amendments and Reauthorization Act (SARA) of 1986, 40 CFR part 355 and 370.

Toxic Substances Control Act (TSCA), 40 CFR part 761.

United States Department of Agriculture, Soil Conservation Service, Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center, Soil Survey of Preble County, Ohio.

United States Geological Survey 7.5-minute Topographic Map, West Alexandria, OH Quadrangle, Photorevised 2019.

ODOT PREBLE FULL-SERVICE MAINTENANCE FACILITY
234 QUAKER-TRACE ROAD
WEST ALEXANDRIA, OHIO

Phase II Environmental Site Assessment

Prepared For:
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202

Prepared By:
Resource International, Inc.
6350 Presidential Gateway
Columbus, Ohio 43231

Rii Project #B-24-018

December 2024

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January 13, 2025

Chad R. Kohler, AIA, NCARB
Architectural Practice Lead
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202

Re: Phase II Environmental Site Assessment
ODOT Preble Full-Service Maintenance Facility
234 Quaker-Trace Road
West Alexandria, Ohio
Rii Project #B-24-018

Dear Chad:

Resource International, Inc. (Rii) is submitting this Phase II Environmental Site Assessment (ESA) report for the property located at 234 Quaker-Trace Road in West Alexandria, Ohio.

We sincerely appreciate this opportunity to provide our environmental services. If you have any questions concerning this report, please do not hesitate to contact us.

Sincerely,

RESOURCE INTERNATIONAL, INC.

Michelle L. Eckels, CPG
Vice President - Environmental Services

Enclosure: Phase II ESA Report

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ACRONYMS

BUSTR	The Bureau of Underground Storage Tank Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
LUST	Leaking Underground Storage Tank
NFA	No Further Action
ODNR	Ohio Department of Natural Resources
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
PPM	Parts per million
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
Rii	Resource International, Inc
SVOCs	Semi-Volatile Organic Compounds
VAP	Voluntary Action Plan
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

Resource International, Inc. (Rii) was retained by Burgess & Niple, Inc. to conduct a Phase II Environmental Site Assessment (ESA) for the Ohio Department of Transportation (ODOT) Preble Full-Service Maintenance Facility at 234 Quaker-Trace Road in West Alexandria, Ohio. The Phase II ESA consisted of subsurface sampling of soil. The purpose of this ESA was to evaluate potential soil contaminant impacts within the project excavation limits of construction, and evaluate the potential handling of impacted excavated soils, construction workers health and safety, final on-site or off-site disposal of impacted soil. Below is a summary of soil sample laboratory results.

SOIL FINDINGS

- The environmental soil borings were completed in areas having potential soil contamination. The soil boring locations are underlain by possible fill materials of varying depths, from 0.75 feet to 1 feet. The fill material consisted of aggregate base and gravel. Varying combinations and alternating layers of clay, sands and gravels were present under the fill material.
- No visible sheen or petroleum odors were observed. Bagged soil samples were field screened with the PID, in which the readings ranged up to 1.8 parts per million (ppm), which are relatively low for detection of any type of petroleum contaminated soil. The soil boring logs are provided in Appendix B and identify the soil samples selected for analyses and the PID field readings.
- Analytical results from soil samples were compared to the following action levels for VOCs, SVOCs, RCRA Metals and PCBs:
    - 2017 BUSTR Soil Re-use action levels
    - 2023 Ohio EPA Voluntary Action Plan (VAP) standards for construction activities
    - 2023 Ohio EPA VAP standards for commercial/industrial

  The complete soil analytical results are summarized in Table 2 in the table section of this report.
- Low levels of TPH – Oil Range Organics were detected in Borings EB-01 and EB-03; however, **the levels did not exceed the BUSTR standards for re-use**.
- Low levels of Acetone and Pyrene were detected in Boring EB-03; however, **the levels did not exceed the VAP standards for commercial/industrial or construction activities**.

CONCLUSION AND RECOMMENDATIONS

Based on soil borings and the laboratory analyses, the soils do not exceed the Ohio EPA VAP Standards or the BUSTR Re-Use Action Levels. Any excavated soils may be reused and remain onsite without restriction or soil capping. The soils do not exceed action levels to deem the material as hazardous waste; therefore, the soil is found to be acceptable for disposal as non-hazardous solid waste. Any landfill should be provided the laboratory analytical report for soil and any other analyses performed by the contractor for waste approval prior to removal from the site.

The entire report should be read to obtain a full understanding in order to make informed design decisions for the proposed project. Complete details of our findings, conclusions, and recommendations are presented in Section 5.0.

1.0 INTRODUCTION

1.1 General

Resource International, Inc. (Rii) was retained by Burgess & Niple, Inc. to conduct a Phase II Environmental Site Assessment (ESA) for the Ohio Department of Transportation (ODOT) Preble Full-Service Maintenance Facility at 234 Quaker-Trace Road in West Alexandria, Ohio. Refer to Figures 1 and 2 in Appendix A for the site location.

The purpose of this Phase II ESA is to:

- Assess whether there has been a release of hazardous substances within the meaning of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), for purposes including landowner liability protections.
- Evaluate potential soil contaminant impacts within the project limits.
- Evaluate the potential handling of impacted excavated soils.
- Construction workers health and safety.
- On-site or off-site disposal of impacted soil.

1.2 Site Background

The subject property consists of 18.84 acres and is currently operated and maintained by ODOT as a maintenance facility for fleet vehicles and snow plows. The facility contains six (6) structures on the southern half of the subject property, and the remaining north half of the subject property is maintained as grass-covered undeveloped land.

Rii completed a Phase I ESA for the subject property in September 2024. The findings within the 2024 report, identified as recognized environmental conditions (RECs), recommended further evaluation for the following findings:

- Concrete patches, indicating that former below ground hydraulic lifts were previously removed, were observed in the garage portion of the Office Building. Older below ground lifts commonly contained pressurized vessels with hydraulic oils, with reservoirs ranging from 35-50 gallons. Hydraulic lifts can become a potential environmental concern if the lifts lose integrity and leak oil into subsurface soils. PCBs were added to hydraulic oils to prevent thermal breakdown, and were used from approximately 1929 until being banned by the EPA in 1979. It is unknown if any soil contamination was observed during the removal of the former hydraulic lift. The locations of the former lifts are depicted on Figure 3 in the Appendix.

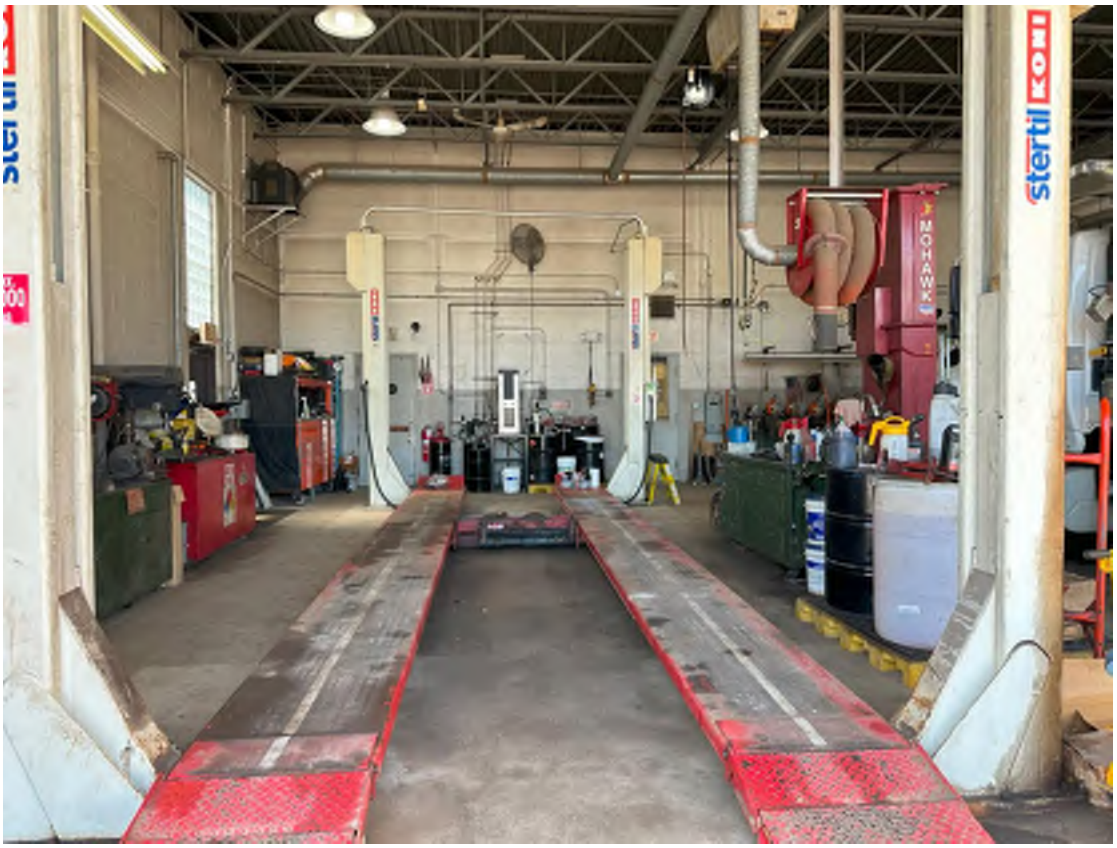


Exhibit 1 – Location of former below ground hydraulic lift.

2.0 ENVIRONMENTAL SAMPLING FIELD PROCEDURES

2.1 Subsurface Environmental Investigation Methodology

On November 15, 2024, five (5) environmental borings (EB-01 through EB-05) were manually hand drilled, and soil samples were collected as part of the environmental scope of work for the Phase II ESA. The general approach included obtaining soil samples from soil below the concrete garage slab through core samples and field screening for sample selection. The environmental boring locations were advanced to a depth of 10 feet.

Boring Location Map and photos are provided in Appendix A, Figure 2, 3, and 4. The soil boring logs are provided in Appendix B. The following is a summary of the general field procedures implemented.

1. Prior to conducting the environmental drilling, Rii field marked the proposed boring locations. At least 48 hours prior to drilling, Rii contacted the Ohio Utilities Protection Services (OUPS) in order to have utilities within the work area located and field marked. In addition, Rii contracted with Frostline Utility Services in Morrow, Ohio to scan and mark utilities within a 50-foot radius of each sampling location.

2. Rii completed the soil borings using a 1-inch diameter core advanced with a hammer drill to a maximum depth of 10 feet. Soils and any waste material retained in the sampler every 2.0-foot interval were visually described and collected for potential laboratory analyses.

3. The Rii environmental geologist maintained the field logs documenting the interpretive soil description, sample depths, field screening levels, and samples selected for analyses, in accordance with ASTM D5434-12, Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock. Visual examination of all collected samples was performed in accordance with ASTM D2488-09a, Standard Practice for Description and Identification of Soil (Visual-Manual Procedure). The boring logs are provided in Appendix B.

4. Soil samples collected were split into two (2) representative portions. Each portion was visually inspected by the environmental geologist and analyzed in the field using a photoionization detector (PID) to determine the presence of organic compounds. One portion was placed in an analytical jar provided by the environmental laboratory for potential analyses. The other portion was used to fill a sealable plastic bag with ample air space to accumulate vapors. The plastic bags were placed in a warm environment for approximately fifteen (15) minutes. The PID was then inserted through the seal and the maximum meter response was recorded as the headspace reading.

5. All soil samples obtained were handled wearing disposable nitrile gloves to minimize cross-contamination of samples. Immediately upon collection, samples to be laboratory analyzed were stored in air-tight, screw type glass jars with Teflon lids and preserved on ice in coolers. Each glass jar was labeled with the project name, sample number and depth, and date and time at which the sample was retained. All non-dedicated sampling equipment was steam cleaned before probing as a means of decontamination. The probe (cutting shoe) was decontaminated after each use with a non-phosphate detergent (alconox) and potable wash water, and rinsed with distilled water.

6. Soil samples selected for laboratory analysis were placed in an ice filled cooler for storage. The samples were transported to Eurofins Laboratory in Columbus, Ohio accompanied by a chain-of-custody. The samples were transported in such a way as to keep the samples as undisturbed as possible.

7. Upon completion of the soil sampling, the borings were backfilled with bentonite pellets and the pavement repaired with mixed concrete and finished level with the existing ground surface. No drill cuttings were generated during the completion of the environmental borings.

2.2 Site Geology

The subject property lies within the Southern Ohio Loamy Till Plain which has a surface of loamy till; end and recessional moraines, commonly associated with boulder belts, between relatively flat-lying ground moraine, cut by steep-valleyed large streams; stream valleys filled with outwash and alternate between broad floodplains and narrows with buried valleys common.

Based on bedrock geology and topography maps of the area from the Ohio Department of Natural Resources (ODNR), the underlying bedrock at the project site consists of the Ordovician-aged Drakes Formation, Whitewater Formation, and Liberty Formation, undivided. This unit is comprised of gray to yellowish gray, to maroon interbedded shale and limestone. The unit features deposition of multiple sedimentary cycles of shale and limestone displaying planar to irregular bedding, and limestone and shale exhibiting wavy to nodular bedding, and ranges between 60 to 150 feet thick. According to ODNR bedrock topography mapping, the bedrock surface in the vicinity of the site is at an approximate elevation of 900± feet, which is approximately 77 feet below the existing surface grade.

3.0 LABORATORY ANALYSIS

3.1 Soil Analyses

A MiniRae 3000 Photoionization detector (PID) was used to obtain field readings and headspace screening of the soil samples. The PID was calibrated with isobutylene prior to commencement of the fieldwork. The criteria for selecting the soil samples submitted for chemical analyses from each boring were as follows:

1. The sample exhibiting the highest headspace reading;
2. If the readings were not significant, the sample exhibiting visual or aromatic contamination;
3. If no visual or aromatic contamination was present, the sample above the soil/water interfaces; and
4. The discretion of the field environmental specialist.

From each of the soil borings, one (1) sample interval was selected for laboratory analysis, based on PID field screening concentration or the above criteria. The boring logs in Appendix B identify the soil samples selected for analyses and the PID field readings.

Soil samples were analyzed for the following contaminants:

1.	Volatile Organic Compounds (VOCs)	EPA Method 8260D
2.	Semi-Volatile Organic Compounds (SVOCs)	EPA Method 8270E
3.	Total Petroleum Hydrocarbons (TPH)	EPA Method 8015D
4.	Polychlorinated Biphenyls (PCBs)	EPA Method 8082A

The soil sample results were compared to:

- 2017 BUSTR Soil Re-use action levels
- 2023 Ohio EPA Voluntary Action Plan (VAP) standards for construction activities
- 2023 Ohio EPA VAP standards for commercial/industrial

The Ohio EPA VAP provides specific standards, per the Ohio Administrative Code rule (OAC 3745-51-24) for cleanup requirements that are protective of human health. Refer to Table 2 at the end of the report for the soil analytical results summary. The laboratory analysis report and the chain-of-custody are provided in Appendix C.

4.0 SUBSURFACE PROFILE

On November 15, 2024, Rii completed environmental soil borings EB-01 through EB-05 to a maximum depth of 10 feet bgs. The borings were located as illustrated on the boring plan provided in Appendix A, Figure 2 and summarized in Table 1 below.

TABLE 1 – ENVIRONMENTAL BORINGS

Boring Number	Easting	Northing	Latitude[1]	Longitude[1]	Ground Elevation[1] (feet)	Environmental Boring Total Depth (feet)
EB-01	707823	4401790	39.740695°	-84.574606°	979	10
EB-02	707817	4401789	39.740687°	-84.574669°	979	10
EB-03	707817	4401792	39.740717°	-84.574674°	979	10
EB-04	707821	4401796	39.740745°	-84.574622°	979	10
EB-05	707819	4401797	39.740762°	-84.574654°	979	10

1. Approximate from Google Earth.

The boring locations were determined and located in the field by Rii representatives. The environmental soil borings were completed in areas having potential soil contamination. The soil boring locations are underlain by possible fill materials of varying depths, from 0.75 feet to 1 feet. The fill material consisted of aggregate base and gravel. Varying combinations and alternating layers of clay, sands and gravels were present under the fill material. No visible sheen or petroleum odors were observed. Bagged soil samples were field screened with the PID, in which the readings ranged up to 1.8 parts per million (ppm).

5.0 FINDINGS AND RECOMMENDATIONS

Rii was retained by the Burgess & Niple, Inc. to conduct a Phase II ESA for the ODOT Preble Full-Service Maintenance Facility at 234 Quaker-Trace Road in West Alexandria, Ohio. The Phase II ESA consisted of subsurface sampling of soil. The purpose of this ESA was to evaluate potential soil contaminant impacts within the project excavation limits of construction, and evaluate the potential handling of impacted excavated soils, construction workers health and safety, final on-site or off-site disposal of impacted soil. Below is a summary of soil and groundwater sample laboratory results.

5.1 Soil Findings

- The environmental soil borings were completed in areas having potential soil contamination. The soil boring locations are underlain by possible fill materials of varying depths, from 0.75 feet to 1 feet. The fill material consisted of aggregate base and gravel. Varying combinations and alternating layers of clay, sands and gravels were present under the fill material.

- No visible sheen or petroleum odors were observed. Bagged soil samples were field screened with the PID, in which the readings ranged up to 1.8 parts per million (ppm), which are relatively low for detection of any type of petroleum contaminated soil. The soil boring logs are pr ovided in Appendix B and identify the soil samples selected for analyses and the PID field readings.

- Analytical results from soil samples were compared to the following action levels for VOCs, SVOCs, RCRA Metals and PCBs:

    - 2017 BUSTR Soil Re-use action levels
    - 2023 Ohio EPA Voluntary Action Plan (VAP) standards for construction activities
    - 2023 Ohio EPA VAP standards for commercial/industrial

    The complete soil analytical results are summarized in Table 2 in the table section of this report.

- Low levels of TPH – Oil Range Organics were detected in Borings EB-01 and EB-03; however, **the levels did not exceed the BUSTR standards for re-use**.

- Low levels of Acetone and Pyrene were detected in Boring EB-03; however, **the levels did not exceed the VAP standards for commercial/industrial or construction activities**.

5.2 Conclusions and Recommendations

Based on soil borings and the laboratory analyses, the soils do not exceed the Ohio EPA VAP Standards or the BUSTR Re-Use Action Levels. Any excavated soils may be reused and remain onsite without restriction or soil capping. The soils do not exceed action levels to deem the material as hazardous waste; therefore, the soil is found to be acceptable for disposal as non-hazardous solid waste. Any landfill should be provided the laboratory analytical report for soil and groundwater and any other analyses performed by the contractor for waste approval prior to removal from the site.

The entire report should be read to obtain a full understanding in order to make informed design decisions for the proposed project.

6.0 RELIABILITY OF REPORT - DISCLAIMER

Results and conclusions presented in this investigation were developed utilizing the soil information and subsequent laboratory analyses obtained from the borings that were made on the site. The borings only depict the soil conditions at the specific locations and the times at which they were made. Since subsurface conditions are known to vary both in space and time, there is inherent risk in the extrapolation of data. Furthermore, this investigation included soil sampling for the specific parameters identified in this report.

Conclusions reached in this report are based upon the objective data available to Rii at the time of forming our opinions and as presented in this report. The accuracy of this report depends upon the accuracy of the data. Every effort is made to evaluate the information by the methods that are generally recognized to constitute the State of the Art at the time of rendering the report and conclusions, and the conclusions reached herein represent our opinions. Rii is not responsible for actual conditions proved to be materially at variance with the data that was available to us and upon which we relied, as presented in this report.

Rii is not responsible for actual conditions proved to be materially at variance with the data that were available to them and upon which they relied, as presented in this report. The opinions, conclusions and recommendations presented in this report are put forth for a specific and proposed purpose and for the specific site discussed. Rii is not responsible for any other application, whether of purpose or location, of our opinions, conclusions and recommendations other than as specifically indicated in this report.

Sections of this report include comment on issues related to groundwater conditions. Prospective contractors for the project must evaluate potential construction problems on the basis of their review of the contract documents, and their own knowledge of and experience in the local area, and on the basis of similar project in other localities, taking into account their own proposed methods and procedures. Rii is not assuming responsibility for control or charge of construction means, methods, techniques, sequences, procedures or scheduling used by the contractors to comply with their obligations under their contracts for the project or for safety precautions and programs in connection with other contractor's work on the project or for any failure of any other contractor to comply with Laws and regulations applicable to its furnishing and/or performing of its work.

7.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

The Rii environmental professional(s) responsible for the Phase II ESA is as follows:

Zachary B. Hamilton, PG, CPG, LPG
Environmental Geologist

Kristy Engel-Shepard
Environmental Project Manager

Michelle L. Eckels, CPG
Vice President of Environmental Services

TABLES

TABLE 2
ODOT PREBLE FULL SERVICE MAINTENANCE FACILITY
234 QUAKER-TRACE ROAD
PHASE II - SOIL ANALYTICAL RESULTS

Analyte	Ohio EPA VAP Comm/Ind. Standards	Ohio EPA VAP Construction Standards	BUSTR Soil Re-Use Action Levels	Site Maximum	EB-01 6-8'	EB-02 6-8'	EB-03 4-6'	EB-04 8-10'	EB-05 6-8'
					11.15.2024	11.15.2024	11.15.2024	11.15.2024	11.15.2024
Percent Solids	-	-	-	**90.9**	**90.9**	**82.5**	**90.3**	**85.7**	**82.2**
Percent Moisture	-	-	-	**17.8**	**9.1**	**17.5**	**9.7**	**14.3**	**17.8**
Total Petroleum Hydrocarbons (TPH), EPA Method 8015D, mg/kg									
TPH - Gasoline Range Organics (GRO)			**1,000**	--	ND	ND	ND	ND	ND
TPH - Diesel Range Organics (DRO)			**2,000**	--	ND	ND	ND	ND	ND
TPH - Oil Range Organics (ORO)			**5,000**	**1400**	**240**	ND	**1,400**	ND	ND
Polychlorinated Biphenols (PCBs), Method 8082A, µg/Kg									
Aroclor-1016	**150,000**	**290,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1221	**22,000**	**300,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1232	**18,000**	**230,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1242	**27,000**	**400,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1248	**26,000**	**390,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1254	**28,000**	**84,000**	**--**	--	ND	ND	ND	ND	ND
Aroclor-1260	**28,000**	**450,000**	**--**	--	ND	ND	ND	ND	ND
Volatile Organic Compounds (VOCs), Method 8260D, µg/Kg									
1,1,1-Trichloroethane	**640,000**	**640,000**	**--**	--	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	**71,000**	**670,000**	**--**	--	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	**130,000**	**1,200,000**	**--**	--	ND	ND	ND	ND	ND
1,1-Dichloroethane	**390,000**	**1,700,000**	**--**	--	ND	ND	ND	ND	ND
1,1-Dichloroethene	**1,200,000**	**360,000**	**--**	--	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	**400,000**	**400,000**	**237**	--	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	**1,600**	**15,000**	**--**	--	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	**380,000**	**380,000**	**--**	--	ND	ND	ND	ND	ND
1,2-Dichloroethane	**52,000**	**480,000**	**10.1**	--	ND	ND	ND	ND	ND
1,2-Dichloropropane	**170,000**	**180,000**	**--**	--	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	**290,000**	**2,600,000**	**--**	--	ND	ND	ND	ND	ND
2-Butanone (MEK)	**28,000,000**	**28,000,000**	**--**	--	ND	ND	ND	ND	ND
2-Hexanone	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	**3,400,000**	**3,400,000**	**--**	--	ND	ND	ND	ND	ND
Acetone	**110,000,000**	**110,000,000**	**--**	**28**	ND	ND	**28**	ND	ND
Benzene	**130,000**	**1,200,000**	**24.6**	--	ND	ND	ND	ND	ND
Bromoform	**910,000**	**910,000**	**--**	--	ND	ND	ND	ND	ND
Bromomethane	**76,000**	**550,000**	**--**	--	ND	ND	ND	ND	ND
Carbon disulfide	**740,000**	**740,000**	**--**	--	ND	ND	ND	ND	ND
Carbon tetrachloride	**74,000**	**460,000**	**--**	--	ND	ND	ND	ND	ND
Chlorobenzene	**760,000**	**760,000**	**--**	--	ND	ND	ND	ND	ND
Chlorodibromomethane	**800,000**	**800,000**	**--**	--	ND	ND	ND	ND	ND
Chloroethane	**2,100,000**	**2,100,000**	**--**	--	ND	ND	ND	ND	ND
Chloroform	**35,000**	**320,000**	**--**	--	ND	ND	ND	ND	ND
Chloromethane	**1,200,000**	**1,300,000**	**--**	--	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	**2,400,000**	**2,400,000**	**--**	--	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	**--**	**--**	**--**	--	ND	ND	ND	ND	ND

TABLE 2
ODOT PREBLE FULL SERVICE MAINTENANCE FACILITY
234 QUAKER-TRACE ROAD
PHASE II - SOIL ANALYTICAL RESULTS

Analyte	Ohio EPA VAP Comm/Ind. Standards	Ohio EPA VAP Construction Standards	BUSTR Soil Re-Use Action Levels	Site Maximum	EB-01 6-8'	EB-02 6-8'	EB-03 4-6'	EB-04 8-10'	EB-05 6-8'
					11.15.2024	11.15.2024	11.15.2024	11.15.2024	11.15.2024
Cyclohexane	**120,000**	**120,000**	**--**	--	ND	ND	ND	ND	ND
Dichlorobromomethane	**33,000**	**300,000**	**--**	--	ND	ND	ND	ND	ND
Dichlorodifluoromethane	**850,000**	**850,000**	**--**	--	ND	ND	ND	ND	ND
Ethylbenzene	**480,000**	**480,000**	**8,450**	--	ND	ND	ND	ND	ND
Ethylene Dibromide	**4,200**	**39,000**	**0.982**	--	ND	ND	ND	ND	ND
Isopropylbenzene (Cumene)	**270,000**	**270,000**	**--**	--	ND	ND	ND	ND	ND
Methyl acetate	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
Methyl tert-butyl ether	**5,400,000**	**8,900,000**	**158**	--	ND	ND	ND	ND	ND
Methylcyclohexane	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
Methylene Chloride	**3,300,000**	**3,300,000**	**--**	--	ND	ND	ND	ND	ND
Styrene	**870,000**	**870,000**	**--**	--	ND	ND	ND	ND	ND
Tetrachloroethene	**170,000**	**170,000**	**--**	--	ND	ND	ND	ND	ND
Toluene	**820,000**	**820,000**	**7,070**	--	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	**1,900,000**	**1,900,000**	**--**	--	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
Trichloroethene	**48,000**	**17,000**	**--**	--	ND	ND	ND	ND	ND
Trichlorofluoromethane	**1,200,000**	**1,200,000**	**--**	--	ND	ND	ND	ND	ND
Vinyl chloride	**49,000**	**280,000**	**--**	--	ND	ND	ND	ND	ND
Xylenes, Total	**260,000**	**260,000**	**42,700**	--	ND	ND	ND	ND	ND
Semi-Volatile Organic Compounds (SVOCs), Method 8270E, µg/Kg									
1,1'-Biphenyl	**16,000,000**	**210,000,000**	**--**	--	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	**250,000,000**	**1,000,000,000**	**--**	--	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	**2,500,000**	**1,600,000**	**--**	--	ND	ND	ND	ND	ND
2,4-Dichlorophenol	**7,600,000**	**32,000,000**	**--**	--	ND	ND	ND	ND	ND
2,4-Dimethylphenol	**51,000,000**	**95,000,000**	**--**	--	ND	ND	ND	ND	ND
2,4-Dinitrophenol	**5,100,000**	**32,000,000**	**--**	--	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	**230,000**	**3,600,000**	**--**	--	ND	ND	ND	ND	ND
2,6-Dinitrotoluene	**47,000**	**750,000**	**--**	--	ND	ND	ND	ND	ND
2-Chloronaphthalene	**370,000,000**	**1,000,000,000**	**--**	--	ND	ND	ND	ND	ND
2-Chlorophenol	**23,000,000**	**27,000,000**	**--**	--	ND	ND	ND	ND	ND
2-Methylnaphthalene	**8,900,000**	**5,800,000**	**--**	--	ND	ND	ND	ND	ND
2-Methylphenol	**130,000,000**	**790,000,000**	**--**	--	ND	ND	ND	ND	ND
2-Nitroaniline	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
2-Nitrophenol	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
3 & 4 Methylphenol	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
3,3'-Dichlorobenzidine	**160,000**	**2,500,000**	**--**	--	ND	ND	ND	ND	ND
3-Nitroaniline	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
4,6-Dinitro-2-methylphenol	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
4-Bromophenyl phenyl ether	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
4-Chloro-3-methylphenol	**250,000,000**	**160,000,000**	**--**	--	ND	ND	ND	ND	ND
4-Chloroaniline	**350,000**	**800,000**	**--**	--	ND	ND	ND	ND	ND
4-Chlorophenyl phenyl ether	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
4-Nitroaniline	**3,500,000**	**16,000,000**	**--**	--	ND	ND	ND	ND	ND
4-Nitrophenol	**--**	**--**	**--**	--	ND	ND	ND	ND	ND
Acenaphthene	**1,000,000,000**	**290,000,000**	**--**	--	ND	ND	ND	ND	ND

TABLE 2
ODOT PREBLE FULL SERVICE MAINTENANCE FACILITY
234 QUAKER-TRACE ROAD
PHASE II - SOIL ANALYTICAL RESULTS

Analyte	Ohio EPA VAP Comm/Ind. Standards	Ohio EPA VAP Construction Standards	BUSTR Soil Re-Use Action Levels	Site Maximum	EB-01 6-8'	EB-02 6-8'	EB-03 4-6'	EB-04 8-10'	EB-05 6-8'
					11.15.2024	11.15.2024	11.15.2024	11.15.2024	11.15.2024
Acenaphthylene	--	--	--	--	ND	ND	ND	ND	ND
Acetophenone	2,500,000	2,500,000	--	--	ND	ND	ND	ND	ND
Anthracene	670,000,000	1,000,000,000	--	--	ND	ND	ND	ND	ND
Atrazine	310,000	4,800,000	--	--	ND	ND	ND	ND	ND
Benzaldehyde	--	--	--	--	ND	ND	ND	ND	ND
Benzo[a]anthracene	610,000	9,600,000	12,000	--	ND	ND	ND	ND	ND
Benzo[a]pyrene	62,000	230,000	1,200	--	ND	ND	ND	ND	ND
Benzo[b]fluoranthene	620,000	10,000,000	12,000	--	ND	ND	ND	ND	ND
Benzo[g,h,i]perylene	--	--	--	--	ND	ND	ND	ND	ND
Benzo[k]fluoranthene	6,200,000	100,000,000	120,000	--	ND	ND	ND	ND	ND
bis (2-chloroisopropyl) ether	1,000,000	1,000,000	--	--	ND	ND	ND	ND	ND
Bis(2-chloroethoxy)methane	7,600,000	48,000,000	--	--	ND	ND	ND	ND	ND
Bis(2-chloroethyl)ether	30,000	290,000	--	--	ND	ND	ND	ND	ND
Bis(2-ethylhexyl) phthalate	5,100,000	79,000,000	--	--	ND	ND	ND	ND	ND
Butyl benzyl phthalate	37,000,000	590,000,000	--	--	ND	ND	ND	ND	ND
Caprolactam	--	--	--	--	ND	ND	ND	ND	ND
Carbazole	--	--	--	--	ND	ND	ND	ND	ND
Chrysene	62,000,000	1,000,000,000	1,200,000	--	ND	ND	ND	ND	ND
Dibenz(a,h)anthracene	62,000	1,000,000	1,200	--	ND	ND	ND	ND	ND
Dibenzofuran	--	--	--	--	ND	ND	ND	ND	ND
Diethyl phthalate	1,000,000,000	1,000,000,000	--	--	ND	ND	ND	ND	ND
Dimethyl phthalate	--	--	--	--	ND	ND	ND	ND	ND
Di-n-butyl phthalate	250,000,000	480,000,000	--	--	ND	ND	ND	ND	ND
Di-n-octyl phthalate	25,000,000	160,000,000	--	--	ND	ND	ND	ND	ND
Fluoranthene	89,000,000	170,000,000	--	--	ND	ND	ND	ND	ND
Fluorene	89,000,000	580,000,000	--	--	ND	ND	ND	ND	ND
Hexachlorobenzene	22,000	16,000	--	--	ND	ND	ND	ND	ND
Hexachlorobutadiene	17,000	17,000	--	--	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	16,000	16,000	--	--	ND	ND	ND	ND	ND
Hexachloroethane	210,000	2,000,000	--	--	ND	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene	620,000	10,000,000	12,000	--	ND	ND	ND	ND	ND
Isophorone	75,000,000	1,000,000,000	--	--	ND	ND	ND	ND	ND
Naphthalene	420,000	560,000	51	--	ND	ND	ND	ND	ND
Nitrobenzene	560,000	3,000,000	--	--	ND	ND	ND	ND	ND
N-Nitrosodi-n-propylamine	10,000	160,000	--	--	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	14,000,000	230,000,000	--	--	ND	ND	ND	ND	ND
Pentachlorophenol	100,000	1,000,000	--	--	ND	ND	ND	ND	ND
Phenanthrene	--	--	--	--	ND	ND	ND	ND	ND
Phenol	760,000,000	940,000,000	--	--	ND	ND	ND	ND	ND
Pyrene	67,000,000	430,000,000	--	110	ND	ND	110	ND	ND

ND = Laboratory Non-Detect

Highlighted = Exceeds Action Levels

APPENDIX A

FIGURES

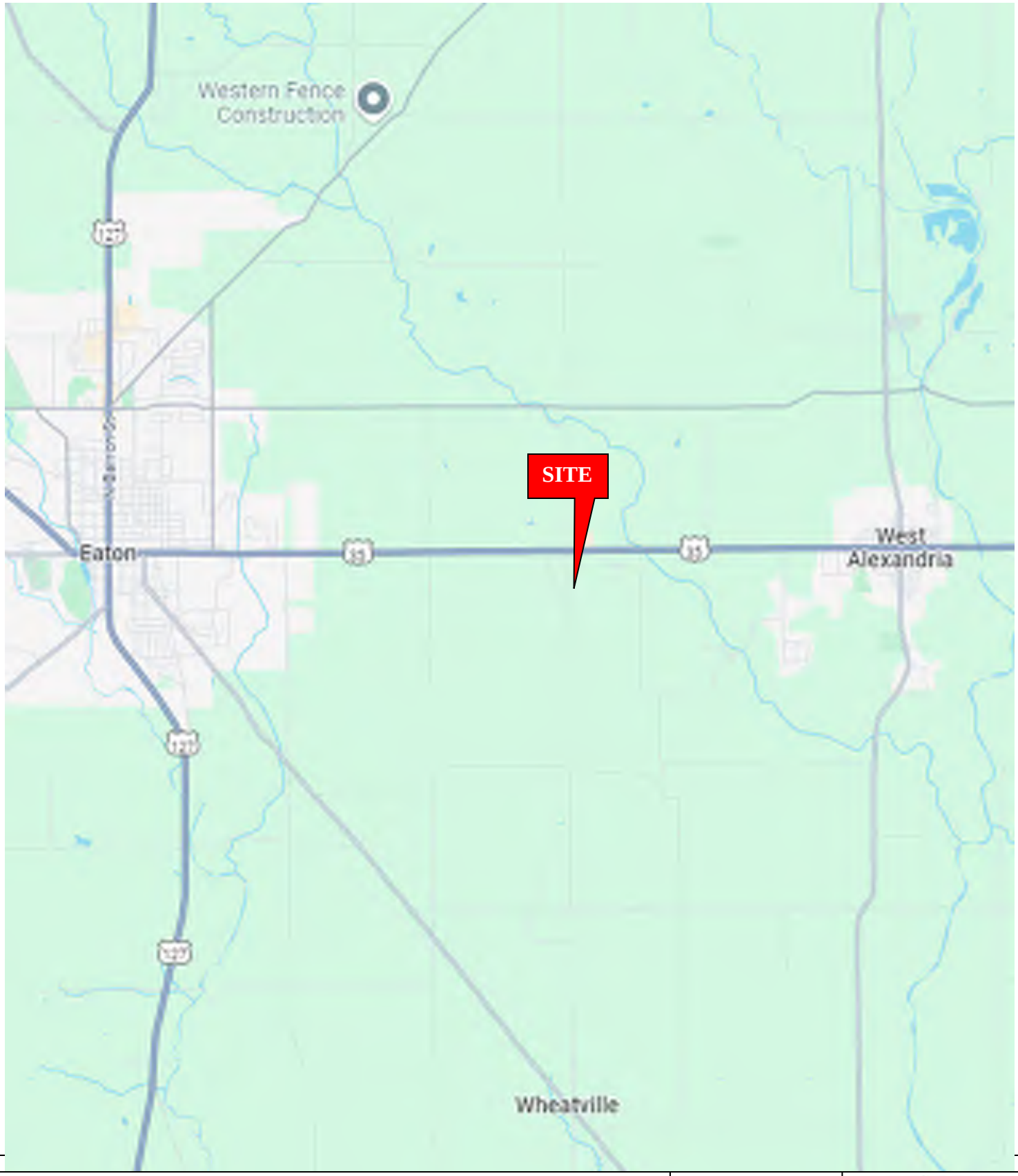


FIGURE 1 - REGIONAL LOCATION MAP

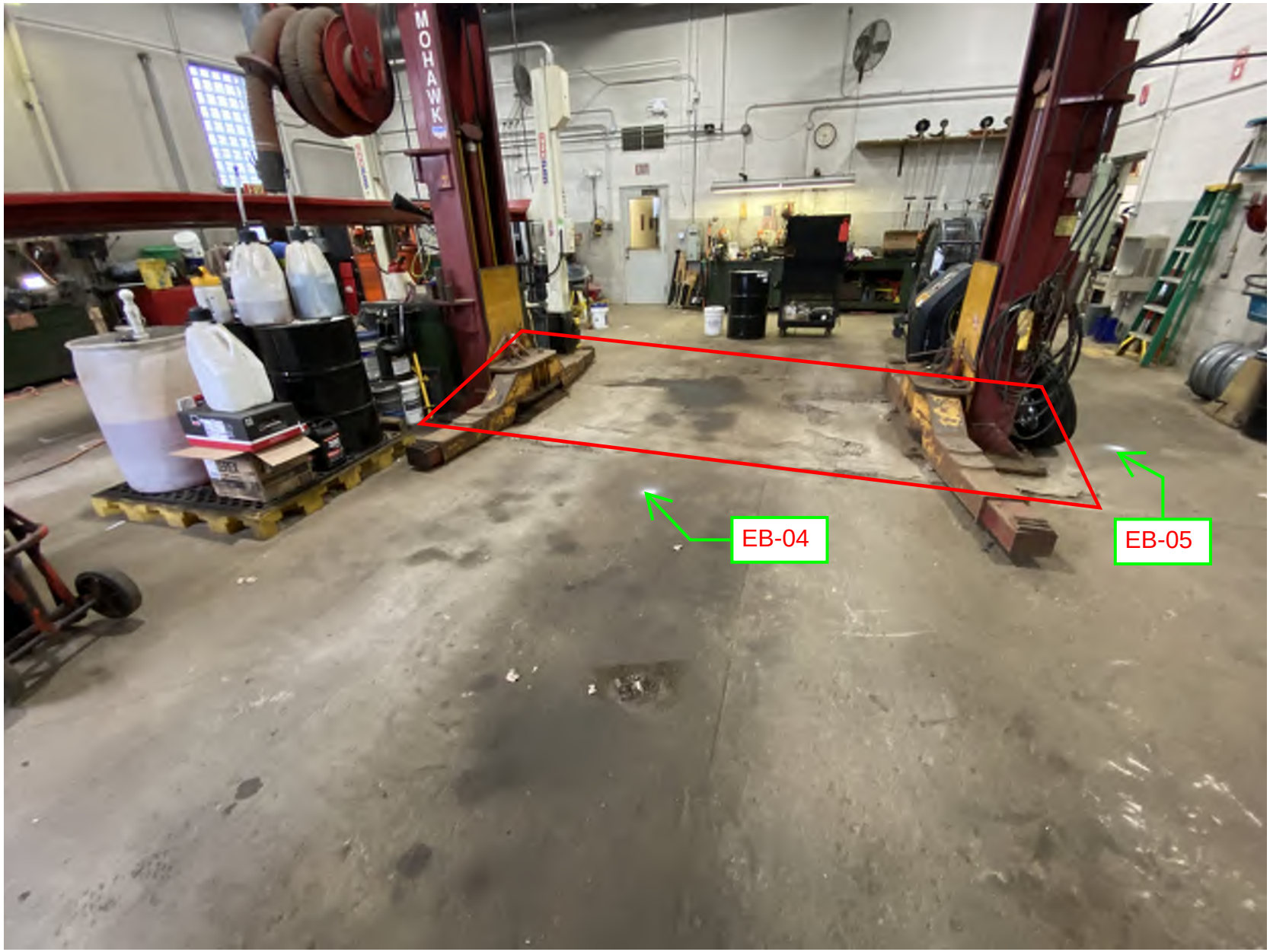
ODOT Preble County Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

N

Rii Project
B-24-018

RESOURCE INTERNATIONAL	ODOT PREBLE FULL-SERVICE MAINTENANCE FACILITY BURGESS & NIPLE, INC.	Boring Location Map Rii Project No. B-24-018	RESOURCE INTERNATIONAL, INC. December 2024 FIGURE 2

RESOURCE INTERNATIONAL	ODOT PREBLE FULL-SERVICE MAINTENANCE FACILITY BURGESS & NIPLE, INC.	Former Lift Locations Rii Project No. B-24-018	RESOURCE INTERNATIONAL, INC. December 2024 FIGURE 3



	ODOT PREBLE FULL-SERVICE MAINTENANCE FACILITY BURGESS & NIPLE, INC.	Former Lift Locations Rii Project No. B-24-018	RESOURCE INTERNATIONAL, INC. December 2024 FIGURE 4

APPENDIX B

BORING LOGS

RESOURCE INTERNATIONAL, INC.

PROJECT: B-24-018	DRILLING FIRM / OPERATOR: RII / J.G.	DRILL RIG: NA	NORTHING	**EXPLORATION ID**	
NAME: ODOT Preble Garage, Phase 2	SAMPLING FIRM / LOGGER: RII / Z.H.	HAMMER: NA	EASTING:	**EB-01**	
CLIENT: Burgess & Niple	DRILLING METHOD: HAND AUGER	CALIBRATION DATE: N/A	ELEVATION: 979 ft.	PAGE	
START: 11-15-24 END: 11-15-24	SAMPLING METHOD: HAND AUGER	ENERGY RATIO (%): 100	COMPLETION DEPTH: 10.0 ft.	1 OF 1	

ELEV. 0.0	DEPTHS	SAMPLE ID	SPT/ RQD	REC (%)	Sample Tested	HP (tsf)	PID (ppm)	MATERIAL DESCRIPTION AND NOTES	GRADATION (%) GR	SA	SI	CL	ATTERBERG LL	PL	PI	WC	USCS CLASS	BACK FILL
-0.3								0.3' - Concrete										
-0.7								0.4' - Aggregate Base										
	1	HA-1		71			0.4	Brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
	2																	
	3	HA-2		92			0.8										CL (V)	
	4																	
-5.5	5	HA-3		92			0.9										CL (V)	
	6							Brown and gray **LEAN CLAY**, moist.										
	7	HA-4		67	X		1.0										CL (V)	
	8																	
-8.5																		
	9	HA-5		100			0.7	Brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
-10.0	EOB 10																	

NOTES: Groundwater was not encountered during or after drilling completion.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: Backfilled with bentonite chips and soil cuttings. Pavement patched with concrete.

00-2023 USCS ENV SAMPLE TESTED2 - OH DOT.GDT - 11/26/24 11:06 - U:\GI8\PROJECTS\2024\IN-24-018.GPJ

RESOURCE INTERNATIONAL, INC.

PROJECT: B-24-018	DRILLING FIRM / OPERATOR: RII / J.G.	DRILL RIG: NA	NORTHING	**EXPLORATION ID**	
NAME: ODOT Preble Garage, Phase 2	SAMPLING FIRM / LOGGER: RII / Z.H.	HAMMER: NA	EASTING:	**EB-02**	
CLIENT: Burgess & Niple	DRILLING METHOD: HAND AUGER	CALIBRATION DATE: N/A	ELEVATION: 979 ft.	PAGE	
START: 11-15-24 END: 11-15-24	SAMPLING METHOD: HAND AUGER	ENERGY RATIO (%): 100	COMPLETION DEPTH: 10.0 ft.	1 OF 1	

ELEV.	DEPTHS	SAMPLE ID	SPT/ RQD	REC (%)	Sample Tested	HP (tsf)	PID (ppm)	*MATERIAL DESCRIPTION AND NOTES*	GRADATION (%) GR	SA	SI	CL	ATTERBERG LL	PL	PI	WC	USCS CLASS	BACK FILL
0.0																		
-0.3								0.3' - Concrete										
-0.7								0.4' - Aggregate Base										
	1	HA-1		50			1.1	Brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
	2																	
	3	HA-2		100			1.3										CL (V)	
	4																	
-5.0	5	HA-3		92			1.2											
-5.5								Dark brown **POORLY GRADED SAND**, moist.									SP (V)	
	6							Brown **LEAN CLAY WITH GRAVEL**, moist.										
	7	HA-4		100	X		1.3										CL (V)	
	8																	
	9	HA-5		100			0.9										CL (V)	
-10.0	EOB 10																	

NOTES: Groundwater was not encountered during or after drilling completion.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: Backfilled with bentonite chips and soil cuttings. Pavement patched with concrete.

00-2023 USCS ENV SAMPLE TESTED2 - OH DOT.GDT - 11/26/24 11:06 - U:\GI8\PROJECTS\2024\IN-24-018.GPJ

RESOURCE INTERNATIONAL, INC.

PROJECT: B-24-018	DRILLING FIRM / OPERATOR: RII / J.G.	DRILL RIG: NA	NORTHING	**EXPLORATION ID**	
NAME: ODOT Preble Garage, Phase 2	SAMPLING FIRM / LOGGER: RII / Z.H.	HAMMER: NA	EASTING:	**EB-03**	
CLIENT: Burgess & Niple	DRILLING METHOD: HAND AUGER	CALIBRATION DATE: N/A	ELEVATION: 979 ft.	PAGE	
START: 11-15-24 END: 11-15-24	SAMPLING METHOD: HAND AUGER	ENERGY RATIO (%): 100	COMPLETION DEPTH: 10.0 ft.	1 OF 1	

ELEV. 0.0	DEPTHS	SAMPLE ID	SPT/ RQD	REC (%)	Sample Tested	HP (tsf)	PID (ppm)	MATERIAL DESCRIPTION AND NOTES	GRADATION (%) GR	SA	SI	CL	ATTERBERG LL	PL	PI	WC	USCS CLASS	BACK FILL
-0.3								0.3' - Concrete										
-0.7								0.4' - Aggregate Base										
	1	HA-1		25			1.4	Brown to gray to brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
	2																	
	3	HA-2		67			1.7										CL (V)	
	4																	
	5	HA-3		100	X		1.8										CL (V)	
	6																	
	7	HA-4		83			1.8										CL (V)	
	8																	
	9	HA-5		79			1.1										CL (V)	
-10.0	EOB 10																	

NOTES: Groundwater was not encountered during or after drilling completion.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: Backfilled with bentonite chips and soil cuttings. Pavement patched with concrete.

00-2023 USCS ENV SAMPLE TESTED2 - OH DOT.GDT - 11/26/24 11:07 - U:\GI8\PROJECTS\2024\IN-24-018.GPJ

RESOURCE INTERNATIONAL, INC.

PROJECT: B-24-018	DRILLING FIRM / OPERATOR: RII / J.G.	DRILL RIG: NA	NORTHING	**EXPLORATION ID**	
NAME: ODOT Preble Garage, Phase 2	SAMPLING FIRM / LOGGER: RII / Z.H.	HAMMER: NA	EASTING:	**EB-04**	
CLIENT: Burgess & Niple	DRILLING METHOD: HAND AUGER	CALIBRATION DATE: N/A	ELEVATION: 979 ft.	PAGE	
START: 11-15-24 END: 11-15-24	SAMPLING METHOD: HAND AUGER	ENERGY RATIO (%): 100	COMPLETION DEPTH: 10.0 ft.	1 OF 1	

ELEV. 0.0	DEPTHS	SAMPLE ID	SPT/ RQD	REC (%)	Sample Tested	HP (tsf)	PID (ppm)	*MATERIAL DESCRIPTION AND NOTES*	GRADATION (%) GR	SA	SI	CL	ATTERBERG LL	PL	PI	WC	USCS CLASS	BACK FILL
-0.3								0.3' - Concrete										
-1.0	1	HA-1		46			1.6	0.7' - Aggregate Base Brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
	2																	
-3.0	3	HA-2		83			1.7	Dark gray to gray and brown **LEAN CLAY**, moist.									CL (V)	
	4																	
	5	HA-3		92			1.4										CL (V)	
	6																	
	7	HA-4		92			1.7										CL (V)	
	8																	
-8.5																		
-8.8								Dark gray **POORLY GRADED SAND**, moist.										
	9	HA-5		88	X		1.4	Gray **LEAN CLAY**, moist.									CL (V)	
-10.0	EOB 10																	

NOTES: Groundwater was not encountered during or after drilling completion.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: Backfilled with bentonite chips and soil cuttings. Pavement patched with concrete.

00-2023 USCS ENV SAMPLE TESTED2 - OH DOT.GDT - 11/26/24 11:08 - U:\GI8\PROJECTS\2024\IN-24-018.GPJ

RESOURCE INTERNATIONAL, INC.

PROJECT: B-24-018	DRILLING FIRM / OPERATOR: RII / J.G.	DRILL RIG: NA	NORTHING	**EXPLORATION ID**	
NAME: ODOT Preble Garage, Phase 2	SAMPLING FIRM / LOGGER: RII / Z.H.	HAMMER: NA	EASTING:	**EB-05**	
CLIENT: Burgess & Niple	DRILLING METHOD: HAND AUGER	CALIBRATION DATE: N/A	ELEVATION: 979 ft.	PAGE	
START: 11-15-24 END: 11-15-24	SAMPLING METHOD: HAND AUGER	ENERGY RATIO (%): 100	COMPLETION DEPTH: 10.0 ft.	1 OF 1	

ELEV. 0.0	DEPTHS	SAMPLE ID	SPT/ RQD	REC (%)	Sample Tested	HP (tsf)	PID (ppm)	***MATERIAL DESCRIPTION AND NOTES***	GRADATION (%) GR	SA	SI	CL	ATTERBERG LL	PL	PI	WC	USCS CLASS	BACK FILL
-0.3								0.3' - Concrete										
-1.0	1	HA-1		38			1.7	0.7' - Aggregate Base Brown **LEAN CLAY WITH GRAVEL**, moist.									CL (V)	
	2																	
-3.0	3	HA-2		75			1.6	Gray to brown **LEAN CLAY**, moist.									CL (V)	
	4																	
	5	HA-3		58			1.5										CL (V)	
	6																	
	7	HA-4		25	X		1.4										CL (V)	
	8																	
	9	HA-5		50			1.0										CL (V)	
-10.0	EOB 10																	

NOTES: Groundwater was not encountered during or after drilling completion.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: Backfilled with bentonite chips and soil cuttings. Pavement patched with concrete.

00-2023 USCS ENV SAMPLE TESTED2 - OH DOT.GDT - 11/26/24 11:09 - U:\GI8\PROJECTS\2024\IN-24-018.GPJ

APPENDIX C

LABORATORY ANALYTICAL REPORT AND & CHAIN-OF-CUSTODY

ANALYTICAL REPORT

PREPARED FOR

Attn: Michelle Eckels
Resource International Inc
6350 Presidential Gateway
Columbus, Ohio 43231

Generated 12/26/2024 10:43:23 AM Revision 2

JOB DESCRIPTION

ODOT Preble Co.

JOB NUMBER

240-215200-1

Eurofins Cleveland
180 S. Van Buren Avenue
Barberton OH 44203

See page two for job notes and contact information.

myEOL

Job Notes

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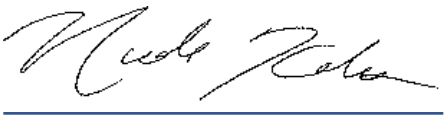

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Revision 2

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Definitions/Glossary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*3	ISTD response or retention time outside acceptable limits.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
240-215200-1

REVISION
The report being provided is a revision of the original report sent on 12/2/2024. The report (revision 1) is being revised due to Client forgot to write the sample depths and times on COC. Client requested updated report..

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/19/2024 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.1°C.

GC/MS VOA
Method 8260D: This sample was taken off a shelf in the sample receiving refrigerator, if this jar was opened in another part of the lab it could have been contaminated.

EB-01 6-8' (240-215200-1), EB-02 6-8' (240-215200-2), EB-03 4-6' (240-215200-3), EB-04 8-10' (240-215200-4) and EB-05 6-8' (240-215200-5)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E: The following sample was diluted due to the nature of the sample matrix: EB-03 4-6' (240-215200-3). Elevated reporting limits (RLs) are provided.

Method 8270E: The matrix spike (MS) recoveries for preparation batch 240-636025 and analytical batch 240-636140 were outside control limits for one or more analytes. See QC Sample Results for detail. A possible bad extraction/injection are suspected because the associated laboratory control sample (LCS) and matrix spike duplicate (MSD) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Gasoline Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Diesel Range Organics
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Method Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CLE
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET CLE
8015D	Gasoline Range Organics (GRO) (GC)	SW846	EET CLE
8015D	Diesel Range Organics (DRO) (GC)	SW846	EET CLE
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	EET CLE
Moisture	Percent Moisture	EPA	EET CLE
3546	Microwave Extraction	SW846	EET CLE
5030C	Purge and Trap	SW846	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Sample Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-215200-1	EB-01 6-8'	Solid	11/15/24 11:35	11/19/24 08:00
240-215200-2	EB-02 6-8'	Solid	11/15/24 13:00	11/19/24 08:00
240-215200-3	EB-03 4-6'	Solid	11/15/24 13:40	11/19/24 08:00
240-215200-4	EB-04 8-10'	Solid	11/15/24 16:05	11/19/24 08:00
240-215200-5	EB-05 6-8'	Solid	11/15/24 16:58	11/19/24 08:00

Detection Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-01 6-8' — Lab Sample ID: 240-215200-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oil Range Organics (C20-C34)	240		50		mg/Kg	1		8015D	Total/NA

Client Sample ID: EB-02 6-8' — Lab Sample ID: 240-215200-2

No Detections.

Client Sample ID: EB-03 4-6' — Lab Sample ID: 240-215200-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	28		24		ug/Kg	1		8260D	Total/NA
Pyrene	110		79		ug/Kg	2		8270E	Total/NA
Oil Range Organics (C20-C34)	1400		250		mg/Kg	5		8015D	Total/NA

Client Sample ID: EB-04 8-10' — Lab Sample ID: 240-215200-4

No Detections.

Client Sample ID: EB-05 6-8' — Lab Sample ID: 240-215200-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-01 6-8'
Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,1,2,2-Tetrachloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,1,2-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,1-Dichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,1-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2,4-Trichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2,4-Trimethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2-Dibromo-3-Chloropropane	ND		9.3		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2-Dichloroethane (EDC)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,2-Dichloropropane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,3-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
1,4-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
2-Butanone (MEK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
2-Hexanone	ND		19		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
4-Methyl-2-pentanone (MIBK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Acetone	ND		23		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Benzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Bromoform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Bromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Carbon disulfide	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Carbon tetrachloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Chlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Chlorodibromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Chloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Chloroform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Chloromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
cis-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
cis-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Cyclohexane	ND		9.3		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Dichlorobromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Dichlorodifluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Ethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Ethylene Dibromide (EDB)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Isopropylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Methyl acetate	ND		23		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Methyl tert-butyl ether	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Methylcyclohexane	ND		9.3		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Methylene Chloride	ND		23		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Styrene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Tetrachloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Toluene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
trans-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
trans-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Trichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Trichlorofluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Vinyl chloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 16:42	1
Xylenes, Total	ND		9.3		ug/Kg		11/20/24 15:25	11/20/24 16:42	1

Client Sample ID: EB-01 6-8'
Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1
Matrix: Solid

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*58 - 125*	*11/20/24 15:25*	*11/20/24 16:42*	*1*
4-Bromofluorobenzene (Surr)	*95*		*41 - 143*	*11/20/24 15:25*	*11/20/24 16:42*	*1*
Dibromofluoromethane (Surr)	*97*		*41 - 138*	*11/20/24 15:25*	*11/20/24 16:42*	*1*
Toluene-d8 (Surr)	*98*		*56 - 125*	*11/20/24 15:25*	*11/20/24 16:42*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,2'-oxybis[1-chloropropane]	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4,5-Trichlorophenol	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4,6-Trichlorophenol	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4-Dichlorophenol	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4-Dimethylphenol	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4-Dinitrophenol	ND	F2	330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,4-Dinitrotoluene	ND	F1 F2	200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2,6-Dinitrotoluene	ND	F1 F2	200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Chloronaphthalene	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Chlorophenol	ND	F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Methylnaphthalene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Methylphenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Nitroaniline	ND	F2	200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
2-Nitrophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
3 & 4 Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
3,3'-Dichlorobenzidine	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
3-Nitroaniline	ND	F2	200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4,6-Dinitro-2-methylphenol	ND	F1 F2	330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Bromophenyl phenyl ether	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Chloro-3-methylphenol	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Chloroaniline	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Chlorophenyl phenyl ether	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Nitroaniline	ND	F2	200		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
4-Nitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Acenaphthene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Acenaphthylene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Acetophenone	ND	F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Anthracene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Atrazine	ND	F1 F2	330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzaldehyde	ND	F2	330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzo[a]anthracene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzo[a]pyrene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzo[b]fluoranthene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzo[g,h,i]perylene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Benzo[k]fluoranthene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Bis(2-chloroethoxy)methane	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Bis(2-chloroethyl)ether	ND	F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Bis(2-ethylhexyl) phthalate	ND	F1	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Butyl benzyl phthalate	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Caprolactam	ND		330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Carbazole	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Chrysene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1

Client Sample ID: EB-01 6-8'

Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1

Matrix: Solid

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Dibenzofuran	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Diethyl phthalate	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Dimethyl phthalate	ND	F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Di-n-butyl phthalate	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Di-n-octyl phthalate	ND	F1 F2	150		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Fluoranthene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Fluorene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Hexachlorobenzene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Hexachlorobutadiene	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Hexachlorocyclopentadiene	ND	F1 F2	330		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Hexachloroethane	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Indeno[1,2,3-cd]pyrene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Isophorone	ND	F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Naphthalene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Nitrobenzene	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
N-Nitrosodi-n-propylamine	ND	F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
N-Nitrosodiphenylamine	ND	F1 F2	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Pentachlorophenol	ND	F1 F2	270		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Phenanthrene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Phenol	ND	F1	100		ug/Kg		11/20/24 09:22	11/21/24 11:34	1
Pyrene	ND	F1 F2	40		ug/Kg		11/20/24 09:22	11/21/24 11:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*63*		*10 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*
2-Fluorobiphenyl (Surr)	*68*		*36 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*
2-Fluorophenol (Surr)	*69*		*26 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*
Nitrobenzene-d5 (Surr)	*64*		*28 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*
Phenol-d5 (Surr)	*77*		*29 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*
Terphenyl-d14 (Surr)	*74*		*37 - 120*	*11/20/24 09:22*	*11/21/24 11:34*	*1*

Method: SW846 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		97		ug/Kg		11/23/24 09:00	11/23/24 13:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*91*		*20 - 140*	*11/23/24 09:00*	*11/23/24 13:18*	*1*

Method: SW846 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		50		mg/Kg		11/20/24 10:33	11/20/24 14:58	1
Oil Range Organics (C20-C34)	**240**		50		mg/Kg		11/20/24 10:33	11/20/24 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*62*		*38 - 120*	*11/20/24 10:33*	*11/20/24 14:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	**82.0**		0.1		%			11/19/24 14:46	1
Percent Moisture (EPA Moisture)	**18.0**		0.1		%			11/19/24 14:46	1

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-01 6-8'
Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1
Matrix: Solid
Percent Solids: 82.0

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1221	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1232	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1242	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1248	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1254	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1
Aroclor-1260	ND		59		ug/Kg	☼	11/20/24 09:31	11/20/24 16:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*64*		*10 - 149*	*11/20/24 09:31*	*11/20/24 16:58*	*1*
DCB Decachlorobiphenyl	*62*		*10 - 174*	*11/20/24 09:31*	*11/20/24 16:58*	*1*

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-02 6-8'

Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2

Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,1,2,2-Tetrachloroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,1,2-Trichloroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,1-Dichloroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,1-Dichloroethene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2,4-Trichlorobenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2,4-Trimethylbenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2-Dibromo-3-Chloropropane	ND		9.8		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2-Dichlorobenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2-Dichloroethane (EDC)	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,2-Dichloropropane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,3-Dichlorobenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
1,4-Dichlorobenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
2-Butanone (MEK)	ND		20		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
2-Hexanone	ND		20		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
4-Methyl-2-pentanone (MIBK)	ND		20		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Acetone	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Benzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Bromoform	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Bromomethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Carbon disulfide	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Carbon tetrachloride	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Chlorobenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Chlorodibromomethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Chloroethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Chloroform	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Chloromethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
cis-1,2-Dichloroethene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
cis-1,3-Dichloropropene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Cyclohexane	ND		9.8		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Dichlorobromomethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Dichlorodifluoromethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Ethylbenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Ethylene Dibromide (EDB)	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Isopropylbenzene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Methyl acetate	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Methyl tert-butyl ether	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Methylcyclohexane	ND		9.8		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Methylene Chloride	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Styrene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Tetrachloroethene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Toluene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
trans-1,2-Dichloroethene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
trans-1,3-Dichloropropene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Trichloroethene	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Trichlorofluoromethane	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Vinyl chloride	ND		4.9		ug/Kg		11/20/24 15:25	11/20/24 17:04	1
Xylenes, Total	ND		9.8		ug/Kg		11/20/24 15:25	11/20/24 17:04	1

Client Sample ID: EB-02 6-8'
Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2
Matrix: Solid

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*58 - 125*	*11/20/24 15:25*	*11/20/24 17:04*	*1*
4-Bromofluorobenzene (Surr)	*103*		*41 - 143*	*11/20/24 15:25*	*11/20/24 17:04*	*1*
Dibromofluoromethane (Surr)	*103*		*41 - 138*	*11/20/24 15:25*	*11/20/24 17:04*	*1*
Toluene-d8 (Surr)	*105*		*56 - 125*	*11/20/24 15:25*	*11/20/24 17:04*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,2'-oxybis[1-chloropropane]	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4,5-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4,6-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4-Dichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4-Dimethylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4-Dinitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,4-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2,6-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Chloronaphthalene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Chlorophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Methylnaphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Methylphenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
2-Nitrophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
3 & 4 Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
3,3'-Dichlorobenzidine	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
3-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4,6-Dinitro-2-methylphenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Bromophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Chloro-3-methylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Chloroaniline	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Chlorophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
4-Nitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Acenaphthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Acenaphthylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Acetophenone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Atrazine	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzaldehyde	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzo[a]anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzo[a]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzo[b]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzo[g,h,i]perylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Benzo[k]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Bis(2-chloroethoxy)methane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Bis(2-chloroethyl)ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Bis(2-ethylhexyl) phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Butyl benzyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Caprolactam	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Carbazole	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Chrysene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1

Client Sample ID: EB-02 6-8'
Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2
Matrix: Solid

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Dibenzofuran	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Diethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Dimethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Di-n-butyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Di-n-octyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Fluorene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Hexachlorobenzene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Hexachlorobutadiene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Hexachlorocyclopentadiene	ND		330		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Hexachloroethane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Indeno[1,2,3-cd]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Isophorone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Naphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Nitrobenzene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
N-Nitrosodi-n-propylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
N-Nitrosodiphenylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Pentachlorophenol	ND		270		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Phenanthrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Phenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 12:46	1
Pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 12:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*59*		*10 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*
2-Fluorobiphenyl (Surr)	*66*		*36 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*
2-Fluorophenol (Surr)	*72*		*26 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*
Nitrobenzene-d5 (Surr)	*67*		*28 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*
Phenol-d5 (Surr)	*75*		*29 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*
Terphenyl-d14 (Surr)	*73*		*37 - 120*	*11/20/24 09:22*	*11/21/24 12:46*	*1*

Method: SW846 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		94		ug/Kg		11/23/24 09:00	11/23/24 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*85*		*20 - 140*	*11/23/24 09:00*	*11/23/24 15:01*	*1*

Method: SW846 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		51		mg/Kg		11/20/24 10:33	11/20/24 15:25	1
Oil Range Organics (C20-C34)	ND		51		mg/Kg		11/20/24 10:33	11/20/24 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*61*		*38 - 120*	*11/20/24 10:33*	*11/20/24 15:25*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	**84.6**		0.1		%			11/19/24 14:46	1
Percent Moisture (EPA Moisture)	**15.4**		0.1		%			11/19/24 14:46	1

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-02 6-8'
Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2
Matrix: Solid
Percent Solids: 84.6

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1221	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1232	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1242	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1248	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1254	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1
Aroclor-1260	ND		57		ug/Kg	☼	11/20/24 09:31	11/20/24 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*67*		*10 - 149*	*11/20/24 09:31*	*11/20/24 17:12*	*1*
DCB Decachlorobiphenyl	*65*		*10 - 174*	*11/20/24 09:31*	*11/20/24 17:12*	*1*

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-03 4-6'
Date Collected: 11/15/24 13:40
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-3
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,1,2,2-Tetrachloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,1,2-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,1-Dichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,1-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2,4-Trichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2,4-Trimethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2-Dibromo-3-Chloropropane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2-Dichloroethane (EDC)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,2-Dichloropropane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,3-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
1,4-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
2-Butanone (MEK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
2-Hexanone	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
4-Methyl-2-pentanone (MIBK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Acetone	**28**		24		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Benzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Bromoform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Bromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Carbon disulfide	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Carbon tetrachloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Chlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Chlorodibromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Chloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Chloroform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Chloromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
cis-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
cis-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Cyclohexane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Dichlorobromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Dichlorodifluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Ethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Ethylene Dibromide (EDB)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Isopropylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Methyl acetate	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Methyl tert-butyl ether	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Methylcyclohexane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Methylene Chloride	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Styrene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Tetrachloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Toluene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
trans-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
trans-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Trichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Trichlorofluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Vinyl chloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 17:25	1
Xylenes, Total	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:25	1

Client Sample ID: EB-03 4-6'
Date Collected: 11/15/24 13:40
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-3
Matrix: Solid

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*58 - 125*	*11/20/24 15:25*	*11/20/24 17:25*	*1*
4-Bromofluorobenzene (Surr)	*100*		*41 - 143*	*11/20/24 15:25*	*11/20/24 17:25*	*1*
Dibromofluoromethane (Surr)	*107*		*41 - 138*	*11/20/24 15:25*	*11/20/24 17:25*	*1*
Toluene-d8 (Surr)	*104*		*56 - 125*	*11/20/24 15:25*	*11/20/24 17:25*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,2'-oxybis[1-chloropropane]	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4,5-Trichlorophenol	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4,6-Trichlorophenol	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4-Dichlorophenol	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4-Dimethylphenol	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4-Dinitrophenol	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,4-Dinitrotoluene	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2,6-Dinitrotoluene	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Chloronaphthalene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Chlorophenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Methylnaphthalene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Nitroaniline	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
2-Nitrophenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
3 & 4 Methylphenol	ND		790		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
3,3'-Dichlorobenzidine	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
3-Nitroaniline	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4,6-Dinitro-2-methylphenol	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Bromophenyl phenyl ether	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Chloro-3-methylphenol	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Chloroaniline	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Chlorophenyl phenyl ether	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Nitroaniline	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
4-Nitrophenol	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Acenaphthene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Acenaphthylene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Acetophenone	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Anthracene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Atrazine	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzaldehyde	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzo[a]anthracene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzo[a]pyrene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzo[b]fluoranthene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzo[g,h,i]perylene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Benzo[k]fluoranthene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Bis(2-chloroethoxy)methane	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Bis(2-chloroethyl)ether	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Bis(2-ethylhexyl) phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Butyl benzyl phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Caprolactam	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Carbazole	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Chrysene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2

Client Sample ID: EB-03 4-6'
Date Collected: 11/15/24 13:40
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-3
Matrix: Solid

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Dibenzofuran	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Diethyl phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Dimethyl phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Di-n-butyl phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Di-n-octyl phthalate	ND		300		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Fluoranthene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Fluorene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Hexachlorobenzene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Hexachlorobutadiene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Hexachlorocyclopentadiene	ND		650		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Hexachloroethane	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Indeno[1,2,3-cd]pyrene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Isophorone	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Naphthalene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Nitrobenzene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
N-Nitrosodi-n-propylamine	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
N-Nitrosodiphenylamine	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Pentachlorophenol	ND		530		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Phenanthrene	ND		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Phenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:10	2
Pyrene	**110**		79		ug/Kg		11/20/24 09:22	11/21/24 13:10	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*78*		*10 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*
2-Fluorobiphenyl (Surr)	*74*		*36 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*
2-Fluorophenol (Surr)	*73*		*26 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*
Nitrobenzene-d5 (Surr)	*55*		*28 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*
Phenol-d5 (Surr)	*75*		*29 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*
Terphenyl-d14 (Surr)	*79*		*37 - 120*	*11/20/24 09:22*	*11/21/24 13:10*	*2*

Method: SW846 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		100		ug/Kg		11/23/24 09:00	11/23/24 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*72*		*20 - 140*	*11/23/24 09:00*	*11/23/24 15:35*	*1*

Method: SW846 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		50		mg/Kg		11/20/24 10:33	11/20/24 15:51	1
Oil Range Organics (C20-C34)	**1400**		250		mg/Kg		11/20/24 10:33	11/26/24 17:26	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*65*		*38 - 120*	*11/20/24 10:33*	*11/20/24 15:51*	*1*
o-Terphenyl	*89*		*38 - 120*	*11/20/24 10:33*	*11/26/24 17:26*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	**81.2**		0.1		%			11/19/24 14:46	1
Percent Moisture (EPA Moisture)	**18.8**		0.1		%			11/19/24 14:46	1

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-03 4-6'
Date Collected: 11/15/24 13:40
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-3
Matrix: Solid
Percent Solids: 81.2

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1221	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1232	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1242	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1248	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1254	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1
Aroclor-1260	ND		63		ug/Kg	☼	11/20/24 09:31	11/20/24 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*63*		*10 - 149*	*11/20/24 09:31*	*11/20/24 17:26*	*1*
DCB Decachlorobiphenyl	*60*		*10 - 174*	*11/20/24 09:31*	*11/20/24 17:26*	*1*

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-04 8-10'
Date Collected: 11/15/24 16:05
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-4
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,1,2,2-Tetrachloroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,1,2-Trichloroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,1-Dichloroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,1-Dichloroethene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2,4-Trichlorobenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2,4-Trimethylbenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2-Dibromo-3-Chloropropane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2-Dichlorobenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2-Dichloroethane (EDC)	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,2-Dichloropropane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,3-Dichlorobenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
1,4-Dichlorobenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
2-Butanone (MEK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
2-Hexanone	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
4-Methyl-2-pentanone (MIBK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Acetone	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Benzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Bromoform	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Bromomethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Carbon disulfide	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Carbon tetrachloride	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Chlorobenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Chlorodibromomethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Chloroethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Chloroform	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Chloromethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
cis-1,2-Dichloroethene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
cis-1,3-Dichloropropene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Cyclohexane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Dichlorobromomethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Dichlorodifluoromethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Ethylbenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Ethylene Dibromide (EDB)	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Isopropylbenzene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Methyl acetate	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Methyl tert-butyl ether	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Methylcyclohexane	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Methylene Chloride	ND		24		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Styrene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Tetrachloroethene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Toluene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
trans-1,2-Dichloroethene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
trans-1,3-Dichloropropene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Trichloroethene	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Trichlorofluoromethane	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Vinyl chloride	ND		4.8		ug/Kg		11/20/24 15:25	11/20/24 17:46	1
Xylenes, Total	ND		9.5		ug/Kg		11/20/24 15:25	11/20/24 17:46	1

Client Sample ID: EB-04 8-10'
Date Collected: 11/15/24 16:05
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-4
Matrix: Solid

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*58 - 125*	*11/20/24 15:25*	*11/20/24 17:46*	*1*
4-Bromofluorobenzene (Surr)	*98*		*41 - 143*	*11/20/24 15:25*	*11/20/24 17:46*	*1*
Dibromofluoromethane (Surr)	*104*		*41 - 138*	*11/20/24 15:25*	*11/20/24 17:46*	*1*
Toluene-d8 (Surr)	*103*		*56 - 125*	*11/20/24 15:25*	*11/20/24 17:46*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,2'-oxybis[1-chloropropane]	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4,5-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4,6-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4-Dichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4-Dimethylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4-Dinitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,4-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2,6-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Chloronaphthalene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Chlorophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Methylnaphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Methylphenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
2-Nitrophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
3 & 4 Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
3,3'-Dichlorobenzidine	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
3-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4,6-Dinitro-2-methylphenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Bromophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Chloro-3-methylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Chloroaniline	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Chlorophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
4-Nitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Acenaphthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Acenaphthylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Acetophenone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Atrazine	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzaldehyde	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzo[a]anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzo[a]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzo[b]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzo[g,h,i]perylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Benzo[k]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Bis(2-chloroethoxy)methane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Bis(2-chloroethyl)ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Bis(2-ethylhexyl) phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Butyl benzyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Caprolactam	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Carbazole	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Chrysene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1

Client Sample ID: EB-04 8-10'
Date Collected: 11/15/24 16:05
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-4
Matrix: Solid

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Dibenzofuran	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Diethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Dimethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Di-n-butyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Di-n-octyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Fluorene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Hexachlorobenzene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Hexachlorobutadiene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Hexachlorocyclopentadiene	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Hexachloroethane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Indeno[1,2,3-cd]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Isophorone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Naphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Nitrobenzene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
N-Nitrosodi-n-propylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
N-Nitrosodiphenylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Pentachlorophenol	ND		270		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Phenanthrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Phenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:33	1
Pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*62*		*10 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*
2-Fluorobiphenyl (Surr)	*70*		*36 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*
2-Fluorophenol (Surr)	*73*		*26 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*
Nitrobenzene-d5 (Surr)	*53*		*28 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*
Phenol-d5 (Surr)	*74*		*29 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*
Terphenyl-d14 (Surr)	*77*		*37 - 120*	*11/20/24 09:22*	*11/21/24 13:33*	*1*

Method: SW846 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		97		ug/Kg		11/23/24 09:00	11/23/24 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*88*		*20 - 140*	*11/23/24 09:00*	*11/23/24 16:10*	*1*

Method: SW846 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		51		mg/Kg		11/20/24 10:33	11/20/24 14:58	1
Oil Range Organics (C20-C34)	ND		51		mg/Kg		11/20/24 10:33	11/20/24 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*67*		*38 - 120*	*11/20/24 10:33*	*11/20/24 14:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	**80.6**		0.1		%			11/19/24 14:46	1
Percent Moisture (EPA Moisture)	**19.4**		0.1		%			11/19/24 14:46	1

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-04 8-10'
Date Collected: 11/15/24 16:05
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-4
Matrix: Solid
Percent Solids: 80.6

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1221	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1232	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1242	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1248	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1254	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1
Aroclor-1260	ND		60		ug/Kg	☼	11/20/24 09:31	11/20/24 17:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*68*		*10 - 149*	*11/20/24 09:31*	*11/20/24 17:40*	*1*
DCB Decachlorobiphenyl	*66*		*10 - 174*	*11/20/24 09:31*	*11/20/24 17:40*	*1*

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-05 6-8'

Date Collected: 11/15/24 16:58
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-5

Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,1,2,2-Tetrachloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,1,2-Trichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,1-Dichloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,1-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2,4-Trichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2,4-Trimethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2-Dibromo-3-Chloropropane	ND		9.4		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2-Dichloroethane (EDC)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,2-Dichloropropane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,3-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
1,4-Dichlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
2-Butanone (MEK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
2-Hexanone	ND		19		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
4-Methyl-2-pentanone (MIBK)	ND		19		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Acetone	ND		24		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Benzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Bromoform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Bromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Carbon disulfide	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Carbon tetrachloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Chlorobenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Chlorodibromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Chloroethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Chloroform	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Chloromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
cis-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
cis-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Cyclohexane	ND		9.4		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Dichlorobromomethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Dichlorodifluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Ethylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Ethylene Dibromide (EDB)	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Isopropylbenzene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Methyl acetate	ND		24		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Methyl tert-butyl ether	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Methylcyclohexane	ND		9.4		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Methylene Chloride	ND		24		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Styrene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Tetrachloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Toluene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
trans-1,2-Dichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
trans-1,3-Dichloropropene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Trichloroethene	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Trichlorofluoromethane	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Vinyl chloride	ND		4.7		ug/Kg		11/20/24 15:25	11/20/24 18:08	1
Xylenes, Total	ND		9.4		ug/Kg		11/20/24 15:25	11/20/24 18:08	1

Client Sample ID: EB-05 6-8'
Date Collected: 11/15/24 16:58
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-5
Matrix: Solid

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*58 - 125*	*11/20/24 15:25*	*11/20/24 18:08*	*1*
4-Bromofluorobenzene (Surr)	*100*		*41 - 143*	*11/20/24 15:25*	*11/20/24 18:08*	*1*
Dibromofluoromethane (Surr)	*109*		*41 - 138*	*11/20/24 15:25*	*11/20/24 18:08*	*1*
Toluene-d8 (Surr)	*108*		*56 - 125*	*11/20/24 15:25*	*11/20/24 18:08*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,2'-oxybis[1-chloropropane]	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4,5-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4,6-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4-Dichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4-Dimethylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4-Dinitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,4-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2,6-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Chloronaphthalene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Chlorophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Methylnaphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Methylphenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
2-Nitrophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
3 & 4 Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
3,3'-Dichlorobenzidine	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
3-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4,6-Dinitro-2-methylphenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Bromophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Chloro-3-methylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Chloroaniline	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Chlorophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
4-Nitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Acenaphthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Acenaphthylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Acetophenone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Atrazine	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzaldehyde	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzo[a]anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzo[a]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzo[b]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzo[g,h,i]perylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Benzo[k]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Bis(2-chloroethoxy)methane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Bis(2-chloroethyl)ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Bis(2-ethylhexyl) phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Butyl benzyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Caprolactam	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Carbazole	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Chrysene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1

Client Sample ID: EB-05 6-8'
Date Collected: 11/15/24 16:58
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-5
Matrix: Solid

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Dibenzofuran	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Diethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Dimethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Di-n-butyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Di-n-octyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Fluorene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Hexachlorobenzene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Hexachlorobutadiene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Hexachlorocyclopentadiene	ND		330		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Hexachloroethane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Indeno[1,2,3-cd]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Isophorone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Naphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Nitrobenzene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
N-Nitrosodi-n-propylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
N-Nitrosodiphenylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Pentachlorophenol	ND		270		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Phenanthrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Phenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 13:57	1
Pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*63*		*10 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*
2-Fluorobiphenyl (Surr)	*72*		*36 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*
2-Fluorophenol (Surr)	*71*		*26 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*
Nitrobenzene-d5 (Surr)	*61*		*28 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*
Phenol-d5 (Surr)	*74*		*29 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*
Terphenyl-d14 (Surr)	*78*		*37 - 120*	*11/20/24 09:22*	*11/21/24 13:57*	*1*

Method: SW846 8015D - Gasoline Range Organics (GRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		97		ug/Kg		11/23/24 09:00	11/23/24 16:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*83*		*20 - 140*	*11/23/24 09:00*	*11/23/24 16:45*	*1*

Method: SW846 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		49		mg/Kg		11/20/24 10:33	11/20/24 15:25	1
Oil Range Organics (C20-C34)	ND		49		mg/Kg		11/20/24 10:33	11/20/24 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*63*		*38 - 120*	*11/20/24 10:33*	*11/20/24 15:25*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids (EPA Moisture)	**85.8**		0.1		%			11/19/24 14:46	1
Percent Moisture (EPA Moisture)	**14.2**		0.1		%			11/19/24 14:46	1

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-05 6-8'
Date Collected: 11/15/24 16:58
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-5
Matrix: Solid
Percent Solids: 85.8

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1221	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1232	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1242	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1248	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1254	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1
Aroclor-1260	ND		58		ug/Kg	☼	11/20/24 09:31	11/20/24 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*66*		*10 - 149*	*11/20/24 09:31*	*11/20/24 17:55*	*1*
DCB Decachlorobiphenyl	*62*		*10 - 174*	*11/20/24 09:31*	*11/20/24 17:55*	*1*

Surrogate Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(58-125)	(41-143)	(41-138)	(56-125)
240-215200-1	EB-01 6-8'	102	95	97	98
240-215200-2	EB-02 6-8'	112	103	103	105
240-215200-3	EB-03 4-6'	115	100	107	104
240-215200-4	EB-04 8-10'	109	98	104	103
240-215200-5	EB-05 6-8'	114	100	109	108
240-215200-5 MS	EB-05 6-8'	105	107	105	105
240-215200-5 MSD	EB-05 6-8'	104	108	103	105
MB 240-636091/7	Method Blank	110	96	106	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPHL
Lab Sample ID	Client Sample ID	(10-120)	(36-120)	(26-120)	(28-120)	(29-120)	(37-120)
240-215200-1	EB-01 6-8'	63	68	69	64	77	74
240-215200-1 MS	EB-01 6-8'	156 S1+ *3	9 S1- *3	55 *3	22 S1- *3	13 S1- *3	4 S1- *3
240-215200-1 MSD	EB-01 6-8'	67	61	67	63	71	64
240-215200-2	EB-02 6-8'	59	66	72	67	75	73
240-215200-3	EB-03 4-6'	78	74	73	55	75	79
240-215200-4	EB-04 8-10'	62	70	73	53	74	77
240-215200-5	EB-05 6-8'	63	72	71	61	74	78
LCS 240-636025/2-A	Lab Control Sample	87	79	81	86	83	75
MB 240-636025/1-A	Method Blank	84	83	87	86	91	80

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		TFT1
Lab Sample ID	Client Sample ID	(20-140)
240-215200-1	EB-01 6-8'	91
240-215200-1 MS	EB-01 6-8'	96
240-215200-1 MSD	EB-01 6-8'	92
240-215200-2	EB-02 6-8'	85
240-215200-3	EB-03 4-6'	72
240-215200-4	EB-04 8-10'	88

Surrogate Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Matrix: Solid **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits) TFT1 (20-140)
240-215200-5	EB-05 6-8'	83
LCS 240-636461/2-A	Lab Control Sample	100
MB 240-636461/1-A	Method Blank	94

Surrogate Legend

TFT = Trifluorotoluene (Surr)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Solid **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits) OTPH (38-120)
240-215200-1	EB-01 6-8'	62
240-215200-2	EB-02 6-8'	61
240-215200-3	EB-03 4-6'	65
240-215200-3	EB-03 4-6'	89
240-215200-4	EB-04 8-10'	67
240-215200-5	EB-05 6-8'	63
LCS 240-636055/2-A	Lab Control Sample	103
MB 240-636055/1-A	Method Blank	99

Surrogate Legend

OTPH = o-Terphenyl

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits) TCX1 (10-149)	DCBP1 (10-174)
240-215200-1	EB-01 6-8'	64	62
240-215200-2	EB-02 6-8'	67	65
240-215200-3	EB-03 4-6'	63	60
240-215200-4	EB-04 8-10'	68	66
240-215200-5	EB-05 6-8'	66	62
LCS 240-636032/2-A	Lab Control Sample	66	79
MB 240-636032/1-A	Method Blank	89	86

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 240-636091/7
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,1,2,2-Tetrachloroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,1,2-Trichloroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,1-Dichloroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,1-Dichloroethene	ND		5.0		ug/Kg			11/20/24 15:13	1
1,2,4-Trichlorobenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
1,2,4-Trimethylbenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
1,2-Dibromo-3-Chloropropane	ND		10		ug/Kg			11/20/24 15:13	1
1,2-Dichlorobenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
1,2-Dichloroethane (EDC)	ND		5.0		ug/Kg			11/20/24 15:13	1
1,2-Dichloropropane	ND		5.0		ug/Kg			11/20/24 15:13	1
1,3-Dichlorobenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
1,4-Dichlorobenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
2-Butanone (MEK)	ND		20		ug/Kg			11/20/24 15:13	1
2-Hexanone	ND		20		ug/Kg			11/20/24 15:13	1
4-Methyl-2-pentanone (MIBK)	ND		20		ug/Kg			11/20/24 15:13	1
Acetone	ND		25		ug/Kg			11/20/24 15:13	1
Benzene	ND		5.0		ug/Kg			11/20/24 15:13	1
Bromoform	ND		5.0		ug/Kg			11/20/24 15:13	1
Bromomethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Carbon disulfide	ND		5.0		ug/Kg			11/20/24 15:13	1
Carbon tetrachloride	ND		5.0		ug/Kg			11/20/24 15:13	1
Chlorobenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
Chlorodibromomethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Chloroethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Chloroform	ND		5.0		ug/Kg			11/20/24 15:13	1
Chloromethane	ND		5.0		ug/Kg			11/20/24 15:13	1
cis-1,2-Dichloroethene	ND		5.0		ug/Kg			11/20/24 15:13	1
cis-1,3-Dichloropropene	ND		5.0		ug/Kg			11/20/24 15:13	1
Cyclohexane	ND		10		ug/Kg			11/20/24 15:13	1
Dichlorobromomethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Dichlorodifluoromethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Ethylbenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
Ethylene Dibromide (EDB)	ND		5.0		ug/Kg			11/20/24 15:13	1
Isopropylbenzene	ND		5.0		ug/Kg			11/20/24 15:13	1
Methyl acetate	ND		25		ug/Kg			11/20/24 15:13	1
Methyl tert-butyl ether	ND		5.0		ug/Kg			11/20/24 15:13	1
Methylcyclohexane	ND		10		ug/Kg			11/20/24 15:13	1
Methylene Chloride	ND		25		ug/Kg			11/20/24 15:13	1
Styrene	ND		5.0		ug/Kg			11/20/24 15:13	1
Tetrachloroethene	ND		5.0		ug/Kg			11/20/24 15:13	1
Toluene	ND		5.0		ug/Kg			11/20/24 15:13	1
trans-1,2-Dichloroethene	ND		5.0		ug/Kg			11/20/24 15:13	1
trans-1,3-Dichloropropene	ND		5.0		ug/Kg			11/20/24 15:13	1
Trichloroethene	ND		5.0		ug/Kg			11/20/24 15:13	1
Trichlorofluoromethane	ND		5.0		ug/Kg			11/20/24 15:13	1
Vinyl chloride	ND		5.0		ug/Kg			11/20/24 15:13	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 240-636091/7
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Xylenes, Total	ND		10		ug/Kg			11/20/24 15:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*58 - 125*		*11/20/24 15:13*	*1*
4-Bromofluorobenzene (Surr)	*96*		*41 - 143*		*11/20/24 15:13*	*1*
Dibromofluoromethane (Surr)	*106*		*41 - 138*		*11/20/24 15:13*	*1*
Toluene-d8 (Surr)	*105*		*56 - 125*		*11/20/24 15:13*	*1*

Lab Sample ID: 240-215200-5 MS
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: EB-05 6-8'
Prep Type: Total/NA
Prep Batch: 636114

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	ND		47.4	40.1		ug/Kg		85	46 - 144
1,1,2,2-Tetrachloroethane	ND		47.4	38.3		ug/Kg		81	26 - 159
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		47.4	41.3		ug/Kg		87	35 - 164
1,1,2-Trichloroethane	ND		47.4	40.6		ug/Kg		86	26 - 149
1,1-Dichloroethane	ND		47.4	41.5		ug/Kg		87	46 - 135
1,1-Dichloroethene	ND		47.4	39.3		ug/Kg		83	44 - 160
1,2,4-Trichlorobenzene	ND		47.4	25.8		ug/Kg		54	10 - 120
1,2,4-Trimethylbenzene	ND		47.4	37.0		ug/Kg		78	10 - 147
1,2-Dibromo-3-Chloropropane	ND		47.4	34.8		ug/Kg		73	12 - 144
1,2-Dichlorobenzene	ND		47.4	30.7		ug/Kg		65	10 - 126
1,2-Dichloroethane (EDC)	ND		47.4	40.8		ug/Kg		86	40 - 132
1,2-Dichloropropane	ND		47.4	40.9		ug/Kg		86	45 - 133
1,3-Dichlorobenzene	ND		47.4	31.7		ug/Kg		67	10 - 131
1,4-Dichlorobenzene	ND		47.4	30.9		ug/Kg		65	10 - 129
2-Butanone (MEK)	ND		94.9	85.6		ug/Kg		85	30 - 157
2-Hexanone	ND		94.9	88.3		ug/Kg		93	20 - 166
4-Methyl-2-pentanone (MIBK)	ND		94.9	92.1		ug/Kg		97	31 - 159
Acetone	ND		94.9	99.2		ug/Kg		82	35 - 167
Benzene	ND		47.4	38.1		ug/Kg		80	39 - 134
Bromoform	ND		47.4	34.7		ug/Kg		73	12 - 144
Bromomethane	ND		47.4	37.9		ug/Kg		80	10 - 161
Carbon disulfide	ND		47.4	38.4		ug/Kg		81	24 - 153
Carbon tetrachloride	ND		47.4	38.3		ug/Kg		81	37 - 145
Chlorobenzene	ND		47.4	36.6		ug/Kg		77	18 - 134
Chlorodibromomethane	ND		47.4	37.1		ug/Kg		78	25 - 143
Chloroethane	ND		47.4	38.4		ug/Kg		81	14 - 159
Chloroform	ND		47.4	40.3		ug/Kg		85	43 - 134
Chloromethane	ND		47.4	31.7		ug/Kg		67	32 - 151
cis-1,2-Dichloroethene	ND		47.4	39.7		ug/Kg		84	48 - 132
cis-1,3-Dichloropropene	ND		47.4	37.8		ug/Kg		80	23 - 139
Cyclohexane	ND		47.4	41.1		ug/Kg		87	31 - 147
Dichlorobromomethane	ND		47.4	39.7		ug/Kg		84	32 - 146
Dichlorodifluoromethane	ND		47.4	24.1		ug/Kg		51	16 - 157
Ethylbenzene	ND		47.4	37.2		ug/Kg		78	17 - 137
Ethylene Dibromide (EDB)	ND		47.4	40.6		ug/Kg		86	31 - 142

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 240-215200-5 MS
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: EB-05 6-8'
Prep Type: Total/NA
Prep Batch: 636114

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Isopropylbenzene	ND		47.4	41.8		ug/Kg		88	10 - 146
Methyl acetate	ND		94.9	85.6		ug/Kg		90	13 - 164
Methyl tert-butyl ether	ND		47.4	43.2		ug/Kg		91	55 - 134
Methylcyclohexane	ND		47.4	38.2		ug/Kg		80	20 - 153
Methylene Chloride	ND		47.4	43.2		ug/Kg		91	38 - 145
m-Xylene & p-Xylene	ND		47.4	37.5		ug/Kg		79	10 - 141
o-Xylene	ND		47.4	38.1		ug/Kg		80	18 - 139
Styrene	ND		47.4	38.4		ug/Kg		81	10 - 149
Tetrachloroethene	ND		47.4	38.1		ug/Kg		80	19 - 147
Toluene	ND		47.4	38.5		ug/Kg		81	30 - 137
trans-1,2-Dichloroethene	ND		47.4	39.9		ug/Kg		84	41 - 145
trans-1,3-Dichloropropene	ND		47.4	41.0		ug/Kg		87	19 - 130
Trichloroethene	ND		47.4	39.4		ug/Kg		83	21 - 158
Trichlorofluoromethane	ND		47.4	39.5		ug/Kg		83	36 - 161
Vinyl chloride	ND		47.4	38.7		ug/Kg		82	32 - 163
Xylenes, Total	ND		94.9	75.6		ug/Kg		80	17 - 138

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*58 - 125*
4-Bromofluorobenzene (Surr)	*107*		*41 - 143*
Dibromofluoromethane (Surr)	*105*		*41 - 138*
Toluene-d8 (Surr)	*105*		*56 - 125*

Lab Sample ID: 240-215200-5 MSD
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: EB-05 6-8'
Prep Type: Total/NA
Prep Batch: 636114

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		46.5	36.8		ug/Kg		79	46 - 144	9	37
1,1,2,2-Tetrachloroethane	ND		46.5	34.2		ug/Kg		74	26 - 159	11	40
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		46.5	37.8		ug/Kg		81	35 - 164	9	37
1,1,2-Trichloroethane	ND		46.5	37.1		ug/Kg		80	26 - 149	9	40
1,1-Dichloroethane	ND		46.5	38.0		ug/Kg		82	46 - 135	9	36
1,1-Dichloroethene	ND		46.5	37.4		ug/Kg		80	44 - 160	5	37
1,2,4-Trichlorobenzene	ND		46.5	20.4		ug/Kg		44	10 - 120	23	40
1,2,4-Trimethylbenzene	ND		46.5	32.8		ug/Kg		71	10 - 147	12	40
1,2-Dibromo-3-Chloropropane	ND		46.5	29.0		ug/Kg		62	12 - 144	18	40
1,2-Dichlorobenzene	ND		46.5	26.9		ug/Kg		58	10 - 126	13	40
1,2-Dichloroethane (EDC)	ND		46.5	37.6		ug/Kg		81	40 - 132	8	35
1,2-Dichloropropane	ND		46.5	37.7		ug/Kg		81	45 - 133	8	37
1,3-Dichlorobenzene	ND		46.5	28.2		ug/Kg		61	10 - 131	12	40
1,4-Dichlorobenzene	ND		46.5	27.7		ug/Kg		60	10 - 129	11	40
2-Butanone (MEK)	ND		92.9	78.8		ug/Kg		79	30 - 157	8	40
2-Hexanone	ND		92.9	81.6		ug/Kg		88	20 - 166	8	40
4-Methyl-2-pentanone (MIBK)	ND		92.9	85.4		ug/Kg		92	31 - 159	8	40
Acetone	ND		92.9	91.8		ug/Kg		76	35 - 167	8	40
Benzene	ND		46.5	34.9		ug/Kg		75	39 - 134	9	40
Bromoform	ND		46.5	30.5		ug/Kg		66	12 - 144	13	40

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 240-215200-5 MSD
Matrix: Solid
Analysis Batch: 636091

Client Sample ID: EB-05 6-8'
Prep Type: Total/NA
Prep Batch: 636114

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Bromomethane	ND		46.5	36.7		ug/Kg		79	10 - 161	3	40
Carbon disulfide	ND		46.5	35.2		ug/Kg		76	24 - 153	9	40
Carbon tetrachloride	ND		46.5	34.7		ug/Kg		75	37 - 145	10	38
Chlorobenzene	ND		46.5	32.6		ug/Kg		70	18 - 134	12	40
Chlorodibromomethane	ND		46.5	33.9		ug/Kg		73	25 - 143	9	40
Chloroethane	ND		46.5	36.4		ug/Kg		78	14 - 159	5	40
Chloroform	ND		46.5	37.0		ug/Kg		80	43 - 134	9	36
Chloromethane	ND		46.5	29.9		ug/Kg		64	32 - 151	6	38
cis-1,2-Dichloroethene	ND		46.5	36.9		ug/Kg		79	48 - 132	7	37
cis-1,3-Dichloropropene	ND		46.5	34.9		ug/Kg		75	23 - 139	8	39
Cyclohexane	ND		46.5	37.0		ug/Kg		80	31 - 147	10	39
Dichlorobromomethane	ND		46.5	36.4		ug/Kg		78	32 - 146	9	39
Dichlorodifluoromethane	ND		46.5	22.8		ug/Kg		49	16 - 157	5	40
Ethylbenzene	ND		46.5	32.9		ug/Kg		71	17 - 137	12	40
Ethylene Dibromide (EDB)	ND		46.5	36.8		ug/Kg		79	31 - 142	10	40
Isopropylbenzene	ND		46.5	36.3		ug/Kg		78	10 - 146	14	40
Methyl acetate	ND		92.9	79.1		ug/Kg		85	13 - 164	8	40
Methyl tert-butyl ether	ND		46.5	39.4		ug/Kg		85	55 - 134	9	37
Methylcyclohexane	ND		46.5	34.0		ug/Kg		73	20 - 153	12	40
Methylene Chloride	ND		46.5	39.4		ug/Kg		85	38 - 145	9	40
m-Xylene & p-Xylene	ND		46.5	33.5		ug/Kg		72	10 - 141	11	40
o-Xylene	ND		46.5	33.8		ug/Kg		73	18 - 139	12	40
Styrene	ND		46.5	33.5		ug/Kg		72	10 - 149	13	40
Tetrachloroethene	ND		46.5	33.4		ug/Kg		72	19 - 147	13	40
Toluene	ND		46.5	34.5		ug/Kg		74	30 - 137	11	40
trans-1,2-Dichloroethene	ND		46.5	36.8		ug/Kg		79	41 - 145	8	37
trans-1,3-Dichloropropene	ND		46.5	38.0		ug/Kg		82	19 - 130	8	40
Trichloroethene	ND		46.5	36.1		ug/Kg		78	21 - 158	9	40
Trichlorofluoromethane	ND		46.5	36.8		ug/Kg		79	36 - 161	7	40
Vinyl chloride	ND		46.5	36.8		ug/Kg		79	32 - 163	5	38
Xylenes, Total	ND		92.9	67.3		ug/Kg		72	17 - 138	12	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*58 - 125*
4-Bromofluorobenzene (Surr)	*108*		*41 - 143*
Dibromofluoromethane (Surr)	*103*		*41 - 138*
Toluene-d8 (Surr)	*105*		*56 - 125*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-636025/1-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636025

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1'-Biphenyl	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,2'-oxybis[1-chloropropane]	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,4,5-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,4,6-Trichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-636025/1-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636025

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,4-Dimethylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,4-Dinitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,4-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2,6-Dinitrotoluene	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Chloronaphthalene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Chlorophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Methylnaphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Methylphenol	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
2-Nitrophenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
3 & 4 Methylphenol	ND		400		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
3,3'-Dichlorobenzidine	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
3-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4,6-Dinitro-2-methylphenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Bromophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Chloro-3-methylphenol	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Chloroaniline	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Chlorophenyl phenyl ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Nitroaniline	ND		200		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
4-Nitrophenol	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Acenaphthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Acenaphthylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Acetophenone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Atrazine	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzaldehyde	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzo[a]anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzo[a]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzo[b]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzo[g,h,i]perylene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Benzo[k]fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Bis(2-chloroethoxy)methane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Bis(2-chloroethyl)ether	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Bis(2-ethylhexyl) phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Butyl benzyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Caprolactam	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Carbazole	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Chrysene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Dibenz(a,h)anthracene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Dibenzofuran	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Diethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Dimethyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Di-n-butyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Di-n-octyl phthalate	ND		150		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Fluoranthene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Fluorene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Hexachlorobenzene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Hexachlorobutadiene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-636025/1-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636025

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorocyclopentadiene	ND		330		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Hexachloroethane	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Indeno[1,2,3-cd]pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Isophorone	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Naphthalene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Nitrobenzene	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
N-Nitrosodi-n-propylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
N-Nitrosodiphenylamine	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Pentachlorophenol	ND		270		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Phenanthrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Phenol	ND		100		ug/Kg		11/20/24 09:22	11/21/24 09:00	1
Pyrene	ND		40		ug/Kg		11/20/24 09:22	11/21/24 09:00	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*84*		*10 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*
2-Fluorobiphenyl (Surr)	*83*		*36 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*
2-Fluorophenol (Surr)	*87*		*26 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*
Nitrobenzene-d5 (Surr)	*86*		*28 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*
Phenol-d5 (Surr)	*91*		*29 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*
Terphenyl-d14 (Surr)	*80*		*37 - 120*	*11/20/24 09:22*	*11/21/24 09:00*	*1*

Lab Sample ID: LCS 240-636025/2-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1'-Biphenyl	1330	1050		ug/Kg		79	54 - 120
2,2'-oxybis[1-chloropropane]	1330	1380		ug/Kg		103	42 - 120
2,4,5-Trichlorophenol	1330	1160		ug/Kg		87	53 - 120
2,4,6-Trichlorophenol	1330	1160		ug/Kg		87	53 - 120
2,4-Dichlorophenol	1330	1110		ug/Kg		83	55 - 120
2,4-Dimethylphenol	1330	1370		ug/Kg		102	39 - 120
2,4-Dinitrophenol	2670	1380		ug/Kg		52	10 - 120
2,4-Dinitrotoluene	1330	1200		ug/Kg		90	56 - 120
2,6-Dinitrotoluene	1330	1190		ug/Kg		89	57 - 120
2-Chloronaphthalene	1330	1080		ug/Kg		81	54 - 120
2-Chlorophenol	1330	1110		ug/Kg		84	54 - 120
2-Methylnaphthalene	1330	953		ug/Kg		71	56 - 120
2-Methylphenol	1330	1100		ug/Kg		82	51 - 120
2-Nitroaniline	1330	1290		ug/Kg		96	53 - 120
2-Nitrophenol	1330	1280		ug/Kg		96	51 - 120
3 & 4 Methylphenol	1330	1090		ug/Kg		82	51 - 120
3,3'-Dichlorobenzidine	2670	1500		ug/Kg		56	31 - 120
3-Nitroaniline	1330	891		ug/Kg		67	36 - 120
4,6-Dinitro-2-methylphenol	2670	2130		ug/Kg		80	10 - 120
4-Bromophenyl phenyl ether	1330	1220		ug/Kg		91	56 - 120
4-Chloro-3-methylphenol	1330	1200		ug/Kg		90	55 - 120
4-Chloroaniline	1330	715		ug/Kg		54	23 - 120

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-636025/2-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4-Chlorophenyl phenyl ether	1330	1140		ug/Kg		85	54 - 120
4-Nitroaniline	1330	1230		ug/Kg		92	46 - 120
4-Nitrophenol	2670	2410		ug/Kg		90	41 - 123
Acenaphthene	1330	1070		ug/Kg		80	56 - 120
Acenaphthylene	1330	1160		ug/Kg		87	54 - 120
Acetophenone	1330	1080		ug/Kg		81	53 - 120
Anthracene	1330	1190		ug/Kg		89	59 - 120
Atrazine	2670	2710		ug/Kg		102	56 - 136
Benzaldehyde	2670	2260		ug/Kg		85	50 - 120
Benzo[a]anthracene	1330	1100		ug/Kg		83	59 - 120
Benzo[a]pyrene	1330	1220		ug/Kg		92	54 - 120
Benzo[b]fluoranthene	1330	1200		ug/Kg		90	58 - 120
Benzo[g,h,i]perylene	1330	1250		ug/Kg		94	56 - 120
Benzo[k]fluoranthene	1330	1210		ug/Kg		91	59 - 120
Bis(2-chloroethoxy)methane	1330	1140		ug/Kg		85	53 - 120
Bis(2-chloroethyl)ether	1330	1070		ug/Kg		80	45 - 120
Bis(2-ethylhexyl) phthalate	1330	1110		ug/Kg		83	52 - 120
Butyl benzyl phthalate	1330	1160		ug/Kg		87	54 - 120
Caprolactam	2670	2460		ug/Kg		92	55 - 120
Carbazole	1330	1250		ug/Kg		94	61 - 120
Chrysene	1330	1090		ug/Kg		82	58 - 120
Dibenz(a,h)anthracene	1330	1160		ug/Kg		87	54 - 120
Dibenzofuran	1330	1070		ug/Kg		80	54 - 120
Diethyl phthalate	1330	1150		ug/Kg		86	58 - 120
Dimethyl phthalate	1330	1160		ug/Kg		87	58 - 120
Di-n-butyl phthalate	1330	1360		ug/Kg		102	54 - 124
Di-n-octyl phthalate	1330	1080		ug/Kg		81	53 - 120
Fluoranthene	1330	1300		ug/Kg		97	59 - 120
Fluorene	1330	1130		ug/Kg		85	56 - 120
Hexachlorobenzene	1330	1210		ug/Kg		91	51 - 120
Hexachlorobutadiene	1330	1040		ug/Kg		78	46 - 120
Hexachlorocyclopentadiene	1330	1410		ug/Kg		105	12 - 120
Hexachloroethane	1330	1070		ug/Kg		80	49 - 120
Indeno[1,2,3-cd]pyrene	1330	1210		ug/Kg		91	53 - 120
Isophorone	1330	1110		ug/Kg		84	52 - 120
Naphthalene	1330	1050		ug/Kg		79	54 - 120
Nitrobenzene	1330	1220		ug/Kg		92	52 - 120
N-Nitrosodi-n-propylamine	1330	1170		ug/Kg		88	52 - 120
N-Nitrosodiphenylamine	1330	1180		ug/Kg		89	58 - 120
Pentachlorophenol	2670	2160		ug/Kg		81	31 - 120
Phenanthrene	1330	1170		ug/Kg		88	57 - 120
Phenol	1330	1100		ug/Kg		82	48 - 120
Pyrene	1330	1120		ug/Kg		84	59 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*10 - 120*
2-Fluorobiphenyl (Surr)	*79*		*36 - 120*
2-Fluorophenol (Surr)	*81*		*26 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-636025/2-A
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636025

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Nitrobenzene-d5 (Surr)	86		28 - 120
Phenol-d5 (Surr)	83		29 - 120
Terphenyl-d14 (Surr)	75		37 - 120

Lab Sample ID: 240-215200-1 MS
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,1'-Biphenyl	ND	F1 F2	1310	118	F1 *3	ug/Kg		9	30 - 120
2,2'-oxybis[1-chloropropane]	ND	F1 F2	1310	180	F1 *3	ug/Kg		14	19 - 120
2,4,5-Trichlorophenol	ND	F2	1310	570	*3	ug/Kg		43	35 - 120
2,4,6-Trichlorophenol	ND	F1 F2	1310	1820	F1 *3	ug/Kg		138	25 - 120
2,4-Dichlorophenol	ND	F1 F2	1310	383	F1 *3	ug/Kg		29	35 - 120
2,4-Dimethylphenol	ND	F2	1310	568	*3	ug/Kg		43	20 - 120
2,4-Dinitrophenol	ND	F2	2620	1450	*3	ug/Kg		55	10 - 120
2,4-Dinitrotoluene	ND	F1 F2	1310	227	F1 *3	ug/Kg		17	24 - 122
2,6-Dinitrotoluene	ND	F1 F2	1310	ND	F1 *3	ug/Kg		15	27 - 120
2-Chloronaphthalene	ND	F1 F2	1310	127	F1 *3	ug/Kg		10	33 - 120
2-Chlorophenol	ND	F2	1310	571	*3	ug/Kg		44	33 - 120
2-Methylnaphthalene	ND	F1 F2	1310	101	F1 *3	ug/Kg		8	18 - 120
2-Methylphenol	ND		1310	694	*3	ug/Kg		53	30 - 120
2-Nitroaniline	ND	F2	1310	411	*3	ug/Kg		31	13 - 128
2-Nitrophenol	ND		1310	688	*3	ug/Kg		52	21 - 120
3 & 4 Methylphenol	ND		1310	686	*3	ug/Kg		52	30 - 120
3,3'-Dichlorobenzidine	ND	F2	2620	452	*3	ug/Kg		17	10 - 143
3-Nitroaniline	ND	F2	1310	ND	*3	ug/Kg		15	10 - 120
4,6-Dinitro-2-methylphenol	ND	F1 F2	2620	4160	F1 *3	ug/Kg		159	10 - 120
4-Bromophenyl phenyl ether	ND	F1 F2	1310	ND	F1 *3	ug/Kg		6	39 - 120
4-Chloro-3-methylphenol	ND	F2	1310	390	*3	ug/Kg		30	26 - 120
4-Chloroaniline	ND	F2	1310	388	*3	ug/Kg		30	19 - 120
4-Chlorophenyl phenyl ether	ND	F1 F2	1310	ND	F1 *3	ug/Kg		6	37 - 120
4-Nitroaniline	ND	F2	1310	457	*3	ug/Kg		35	22 - 120
4-Nitrophenol	ND		2620	2140	*3	ug/Kg		82	18 - 124
Acenaphthene	ND	F1 F2	1310	129	F1 *3	ug/Kg		10	26 - 120
Acenaphthylene	ND	F1 F2	1310	168	F1 *3	ug/Kg		13	25 - 120
Acetophenone	ND	F2	1310	521	*3	ug/Kg		40	32 - 120
Anthracene	ND	F1 F2	1310	121	F1 *3	ug/Kg		9	25 - 121
Atrazine	ND	F1 F2	2620	713	F1 *3	ug/Kg		27	43 - 130
Benzaldehyde	ND	F2	2620	1010	*3	ug/Kg		38	27 - 120
Benzo[a]anthracene	ND	F1 F2	1310	85.6	F1 *3	ug/Kg		7	21 - 130
Benzo[a]pyrene	ND	F1 F2	1310	91.4	F1 *3	ug/Kg		7	12 - 131
Benzo[b]fluoranthene	ND	F1 F2	1310	88.3	F1 *3	ug/Kg		7	14 - 134
Benzo[g,h,i]perylene	ND	F1 F2	1310	71.4	F1 *3	ug/Kg		5	10 - 145
Benzo[k]fluoranthene	ND	F1 F2	1310	92.6	F1 *3	ug/Kg		7	18 - 126
Bis(2-chloroethoxy)methane	ND	F1 F2	1310	282	F1 *3	ug/Kg		21	28 - 120
Bis(2-chloroethyl)ether	ND	F2	1310	477	*3	ug/Kg		36	23 - 120
Bis(2-ethylhexyl) phthalate	ND	F1	1310	ND	F1 *3	ug/Kg		0	24 - 131

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-215200-1 MS
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Butyl benzyl phthalate	ND	F1 F2	1310	ND	F1 *3	ug/Kg		4	41 - 120
Caprolactam	ND		2620	1420	*3	ug/Kg		54	28 - 120
Carbazole	ND	F1 F2	1310	233	F1 *3	ug/Kg		18	40 - 120
Chrysene	ND	F1 F2	1310	88.2	F1 *3	ug/Kg		7	20 - 126
Dibenz(a,h)anthracene	ND	F1 F2	1310	47.8	F1 *3	ug/Kg		4	10 - 141
Dibenzofuran	ND	F1 F2	1310	139	F1 *3	ug/Kg		11	35 - 120
Diethyl phthalate	ND	F1 F2	1310	266	F1 *3	ug/Kg		20	33 - 120
Dimethyl phthalate	ND	F2	1310	428	*3	ug/Kg		33	15 - 120
Di-n-butyl phthalate	ND	F1 F2	1310	ND	F1 *3	ug/Kg		5	25 - 132
Di-n-octyl phthalate	ND	F1 F2	1310	ND	F1 *3	ug/Kg		4	37 - 120
Fluoranthene	ND	F1 F2	1310	129	F1 *3	ug/Kg		10	18 - 139
Fluorene	ND	F1 F2	1310	123	F1 *3	ug/Kg		9	29 - 120
Hexachlorobenzene	ND	F1 F2	1310	61.5	F1 *3	ug/Kg		5	36 - 120
Hexachlorobutadiene	ND	F1 F2	1310	ND	F1 *3	ug/Kg		3	18 - 120
Hexachlorocyclopentadiene	ND	F1 F2	1310	ND	F1 *3	ug/Kg		3	10 - 120
Hexachloroethane	ND	F1 F2	1310	ND	F1 *3	ug/Kg		6	14 - 120
Indeno[1,2,3-cd]pyrene	ND	F1 F2	1310	60.4	F1 *3	ug/Kg		5	10 - 143
Isophorone	ND	F2	1310	525	*3	ug/Kg		40	33 - 120
Naphthalene	ND	F1 F2	1310	162	F1 *3	ug/Kg		11	17 - 120
Nitrobenzene	ND	F1 F2	1310	313	F1 *3	ug/Kg		24	25 - 120
N-Nitrosodi-n-propylamine	ND	F2	1310	441	*3	ug/Kg		34	33 - 120
N-Nitrosodiphenylamine	ND	F1 F2	1310	152	F1 *3	ug/Kg		12	35 - 120
Pentachlorophenol	ND	F1 F2	2620	7010	E F1 *3	ug/Kg		267	10 - 120
Phenanthrene	ND	F1 F2	1310	139	F1 *3	ug/Kg		11	18 - 122
Phenol	ND	F1	1310	ND	F1 *3	ug/Kg		0	29 - 120
Pyrene	ND	F1 F2	1310	142	F1 *3	ug/Kg		11	18 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*156*	*S1+ *3*	*10 - 120*
2-Fluorobiphenyl (Surr)	*9*	*S1- *3*	*36 - 120*
2-Fluorophenol (Surr)	*55*	**3*	*26 - 120*
Nitrobenzene-d5 (Surr)	*22*	*S1- *3*	*28 - 120*
Phenol-d5 (Surr)	*13*	*S1- *3*	*29 - 120*
Terphenyl-d14 (Surr)	*4*	*S1- *3*	*37 - 120*

Lab Sample ID: 240-215200-1 MSD
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1'-Biphenyl	ND	F1 F2	1330	831	F2	ug/Kg		62	30 - 120	150	40
2,2'-oxybis[1-chloropropane]	ND	F1 F2	1330	898	F2	ug/Kg		67	19 - 120	133	40
2,4,5-Trichlorophenol	ND	F2	1330	1010	F2	ug/Kg		76	35 - 120	56	40
2,4,6-Trichlorophenol	ND	F1 F2	1330	839	F2	ug/Kg		63	25 - 120	74	40
2,4-Dichlorophenol	ND	F1 F2	1330	1000	F2	ug/Kg		75	35 - 120	90	40
2,4-Dimethylphenol	ND	F2	1330	1160	F2	ug/Kg		87	20 - 120	68	40
2,4-Dinitrophenol	ND	F2	2660	359	F2	ug/Kg		13	10 - 120	121	40
2,4-Dinitrotoluene	ND	F1 F2	1330	1070	F2	ug/Kg		80	24 - 122	130	40

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-215200-1 MSD
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,6-Dinitrotoluene	ND	F1 F2	1330	1050	F2	ug/Kg		79	27 - 120	138	40
2-Chloronaphthalene	ND	F1 F2	1330	828	F2	ug/Kg		62	33 - 120	147	40
2-Chlorophenol	ND	F2	1330	915	F2	ug/Kg		69	33 - 120	46	40
2-Methylnaphthalene	ND	F1 F2	1330	719	F2	ug/Kg		54	18 - 120	151	40
2-Methylphenol	ND		1330	944		ug/Kg		71	30 - 120	31	40
2-Nitroaniline	ND	F2	1330	1100	F2	ug/Kg		83	13 - 128	91	40
2-Nitrophenol	ND		1330	987		ug/Kg		74	21 - 120	36	40
3 & 4 Methylphenol	ND		1330	1020		ug/Kg		76	30 - 120	39	40
3,3'-Dichlorobenzidine	ND	F2	2660	2160	F2	ug/Kg		81	10 - 143	131	40
3-Nitroaniline	ND	F2	1330	936	F2	ug/Kg		70	10 - 120	132	40
4,6-Dinitro-2-methylphenol	ND	F1 F2	2660	552	F2	ug/Kg		21	10 - 120	153	40
4-Bromophenyl phenyl ether	ND	F1 F2	1330	994	F2	ug/Kg		75	39 - 120	171	40
4-Chloro-3-methylphenol	ND	F2	1330	1080	F2	ug/Kg		81	26 - 120	94	40
4-Chloroaniline	ND	F2	1330	761	F2	ug/Kg		57	19 - 120	65	40
4-Chlorophenyl phenyl ether	ND	F1 F2	1330	926	F2	ug/Kg		70	37 - 120	169	40
4-Nitroaniline	ND	F2	1330	905	F2	ug/Kg		68	22 - 120	66	40
4-Nitrophenol	ND		2660	1890		ug/Kg		71	18 - 124	12	40
Acenaphthene	ND	F1 F2	1330	881	F2	ug/Kg		66	26 - 120	149	40
Acenaphthylene	ND	F1 F2	1330	952	F2	ug/Kg		71	25 - 120	140	40
Acetophenone	ND	F2	1330	862	F2	ug/Kg		65	32 - 120	49	40
Anthracene	ND	F1 F2	1330	1010	F2	ug/Kg		76	25 - 121	157	40
Atrazine	ND	F1 F2	2660	2390	F2	ug/Kg		90	43 - 130	108	40
Benzaldehyde	ND	F2	2660	1580	F2	ug/Kg		59	27 - 120	44	40
Benzo[a]anthracene	ND	F1 F2	1330	922	F2	ug/Kg		69	21 - 130	166	40
Benzo[a]pyrene	ND	F1 F2	1330	999	F2	ug/Kg		75	12 - 131	166	40
Benzo[b]fluoranthene	ND	F1 F2	1330	967	F2	ug/Kg		73	14 - 134	167	40
Benzo[g,h,i]perylene	ND	F1 F2	1330	864	F2	ug/Kg		65	10 - 145	169	40
Benzo[k]fluoranthene	ND	F1 F2	1330	1030	F2	ug/Kg		77	18 - 126	167	40
Bis(2-chloroethoxy)methane	ND	F1 F2	1330	981	F2	ug/Kg		74	28 - 120	111	40
Bis(2-chloroethyl)ether	ND	F2	1330	920	F2	ug/Kg		69	23 - 120	63	40
Bis(2-ethylhexyl) phthalate	ND	F1	1330	1030		ug/Kg		77	24 - 131	NC	40
Butyl benzyl phthalate	ND	F1 F2	1330	1120	F2	ug/Kg		84	41 - 120	180	40
Caprolactam	ND		2660	1540		ug/Kg		58	28 - 120	9	35
Carbazole	ND	F1 F2	1330	999	F2	ug/Kg		75	40 - 120	124	40
Chrysene	ND	F1 F2	1330	918	F2	ug/Kg		69	20 - 126	165	40
Dibenz(a,h)anthracene	ND	F1 F2	1330	786	F2	ug/Kg		59	10 - 141	177	40
Dibenzofuran	ND	F1 F2	1330	902	F2	ug/Kg		68	35 - 120	147	40
Diethyl phthalate	ND	F1 F2	1330	1070	F2	ug/Kg		80	33 - 120	120	40
Dimethyl phthalate	ND	F2	1330	1020	F2	ug/Kg		77	15 - 120	82	40
Di-n-butyl phthalate	ND	F1 F2	1330	1170	F2	ug/Kg		88	25 - 132	178	40
Di-n-octyl phthalate	ND	F1 F2	1330	1090	F2	ug/Kg		82	37 - 120	183	40
Fluoranthene	ND	F1 F2	1330	1020	F2	ug/Kg		76	18 - 139	155	40
Fluorene	ND	F1 F2	1330	943	F2	ug/Kg		71	29 - 120	154	40
Hexachlorobenzene	ND	F1 F2	1330	924	F2	ug/Kg		69	36 - 120	175	40
Hexachlorobutadiene	ND	F1 F2	1330	587	F2	ug/Kg		44	18 - 120	173	40
Hexachlorocyclopentadiene	ND	F1 F2	1330	613	F2	ug/Kg		46	10 - 120	176	40
Hexachloroethane	ND	F1 F2	1330	474	F2	ug/Kg		36	14 - 120	145	40
Indeno[1,2,3-cd]pyrene	ND	F1 F2	1330	844	F2	ug/Kg		63	10 - 143	173	40
Isophorone	ND	F2	1330	975	F2	ug/Kg		73	33 - 120	60	40

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-215200-1 MSD
Matrix: Solid
Analysis Batch: 636140

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636025

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Naphthalene	ND	F1 F2	1330	737	F2	ug/Kg		54	17 - 120	128	40
Nitrobenzene	ND	F1 F2	1330	904	F2	ug/Kg		68	25 - 120	97	40
N-Nitrosodi-n-propylamine	ND	F2	1330	955	F2	ug/Kg		72	33 - 120	74	40
N-Nitrosodiphenylamine	ND	F1 F2	1330	1010	F2	ug/Kg		76	35 - 120	148	40
Pentachlorophenol	ND	F1 F2	2660	962	F2	ug/Kg		36	10 - 120	152	40
Phenanthrene	ND	F1 F2	1330	965	F2	ug/Kg		72	18 - 122	150	40
Phenol	ND	F1	1330	939		ug/Kg		71	29 - 120	NC	40
Pyrene	ND	F1 F2	1330	996	F2	ug/Kg		75	18 - 136	150	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*67*		*10 - 120*
2-Fluorobiphenyl (Surr)	*61*		*36 - 120*
2-Fluorophenol (Surr)	*67*		*26 - 120*
Nitrobenzene-d5 (Surr)	*63*		*28 - 120*
Phenol-d5 (Surr)	*71*		*29 - 120*
Terphenyl-d14 (Surr)	*64*		*37 - 120*

Method: 8015D - Gasoline Range Organics (GRO) (GC)

Lab Sample ID: MB 240-636461/1-A
Matrix: Solid
Analysis Batch: 636462

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636461

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	ND		99		ug/Kg		11/23/24 09:00	11/23/24 12:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Trifluorotoluene (Surr)	*94*		*20 - 140*	*11/23/24 09:00*	*11/23/24 12:08*	*1*

Lab Sample ID: LCS 240-636461/2-A
Matrix: Solid
Analysis Batch: 636462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636461

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics (C6-C12)			806	854		ug/Kg		106	75 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Trifluorotoluene (Surr)	*100*		*20 - 140*

Lab Sample ID: 240-215200-1 MS
Matrix: Solid
Analysis Batch: 636462

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636461

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics (C6-C12)	ND		774	657		ug/Kg		85	10 - 134		

Method: 8015D - Gasoline Range Organics (GRO) (GC) (Continued)

Lab Sample ID: 240-215200-1 MS
Matrix: Solid
Analysis Batch: 636462

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636461

Surrogate	MS %Recovery	MS Qualifier	Limits
Trifluorotoluene (Surr)	*96*		*20 - 140*

Lab Sample ID: 240-215200-1 MSD
Matrix: Solid
Analysis Batch: 636462

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA
Prep Batch: 636461

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics (C6-C12)	ND		753	688		ug/Kg		91	10 - 134	5	40

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Trifluorotoluene (Surr)	*92*		*20 - 140*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 240-636055/1-A
Matrix: Solid
Analysis Batch: 635993

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636055

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C20)	ND		50		mg/Kg		11/20/24 10:33	11/20/24 14:58	1
Oil Range Organics (C20-C34)	ND		50		mg/Kg		11/20/24 10:33	11/20/24 14:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	*99*		*38 - 120*	*11/20/24 10:33*	*11/20/24 14:58*	*1*

Lab Sample ID: LCS 240-636055/2-A
Matrix: Solid
Analysis Batch: 635993

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636055

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics [C10 - C28]			250	220		mg/Kg		88	41 - 120		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	*103*		*38 - 120*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 240-636032/1-A
Matrix: Solid
Analysis Batch: 636041

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1016	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1
Aroclor-1221	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1
Aroclor-1232	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1
Aroclor-1242	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1
Aroclor-1248	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 240-636032/1-A
Matrix: Solid
Analysis Batch: 636041

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 636032

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aroclor-1254	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1
Aroclor-1260	ND		50		ug/Kg		11/20/24 09:31	11/20/24 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*89*		*10 - 149*	*11/20/24 09:31*	*11/20/24 14:06*	*1*
DCB Decachlorobiphenyl	*86*		*10 - 174*	*11/20/24 09:31*	*11/20/24 14:06*	*1*

Lab Sample ID: LCS 240-636032/2-A
Matrix: Solid
Analysis Batch: 636041

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 636032

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Aroclor-1016			1000	667		ug/Kg		67	28 - 140		
Aroclor-1260			1000	767		ug/Kg		77	39 - 153		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*66*		*10 - 149*
DCB Decachlorobiphenyl	*79*		*10 - 174*

Method: Moisture - Percent Moisture

Lab Sample ID: 240-215200-1 DU
Matrix: Solid
Analysis Batch: 635927

Client Sample ID: EB-01 6-8'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Solids	82.0			84.7		%				3	20
Percent Moisture	18.0			15.3		%				16	20

GC/MS VOA

Analysis Batch: 636091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	8260D	636114
240-215200-2	EB-02 6-8'	Total/NA	Solid	8260D	636114
240-215200-3	EB-03 4-6'	Total/NA	Solid	8260D	636114
240-215200-4	EB-04 8-10'	Total/NA	Solid	8260D	636114
240-215200-5	EB-05 6-8'	Total/NA	Solid	8260D	636114
MB 240-636091/7	Method Blank	Total/NA	Solid	8260D	
240-215200-5 MS	EB-05 6-8'	Total/NA	Solid	8260D	636114
240-215200-5 MSD	EB-05 6-8'	Total/NA	Solid	8260D	636114

Prep Batch: 636114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	5030C	
240-215200-2	EB-02 6-8'	Total/NA	Solid	5030C	
240-215200-3	EB-03 4-6'	Total/NA	Solid	5030C	
240-215200-4	EB-04 8-10'	Total/NA	Solid	5030C	
240-215200-5	EB-05 6-8'	Total/NA	Solid	5030C	
240-215200-5 MS	EB-05 6-8'	Total/NA	Solid	5030C	
240-215200-5 MSD	EB-05 6-8'	Total/NA	Solid	5030C	

GC/MS Semi VOA

Prep Batch: 636025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	3546	
240-215200-2	EB-02 6-8'	Total/NA	Solid	3546	
240-215200-3	EB-03 4-6'	Total/NA	Solid	3546	
240-215200-4	EB-04 8-10'	Total/NA	Solid	3546	
240-215200-5	EB-05 6-8'	Total/NA	Solid	3546	
MB 240-636025/1-A	Method Blank	Total/NA	Solid	3546	
LCS 240-636025/2-A	Lab Control Sample	Total/NA	Solid	3546	
240-215200-1 MS	EB-01 6-8'	Total/NA	Solid	3546	
240-215200-1 MSD	EB-01 6-8'	Total/NA	Solid	3546	

Analysis Batch: 636140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	8270E	636025
240-215200-2	EB-02 6-8'	Total/NA	Solid	8270E	636025
240-215200-3	EB-03 4-6'	Total/NA	Solid	8270E	636025
240-215200-4	EB-04 8-10'	Total/NA	Solid	8270E	636025
240-215200-5	EB-05 6-8'	Total/NA	Solid	8270E	636025
MB 240-636025/1-A	Method Blank	Total/NA	Solid	8270E	636025
LCS 240-636025/2-A	Lab Control Sample	Total/NA	Solid	8270E	636025
240-215200-1 MS	EB-01 6-8'	Total/NA	Solid	8270E	636025
240-215200-1 MSD	EB-01 6-8'	Total/NA	Solid	8270E	636025

GC VOA

Prep Batch: 636461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	5030C	
240-215200-2	EB-02 6-8'	Total/NA	Solid	5030C	
240-215200-3	EB-03 4-6'	Total/NA	Solid	5030C	

GC VOA (Continued)

Prep Batch: 636461 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-4	EB-04 8-10'	Total/NA	Solid	5030C	
240-215200-5	EB-05 6-8'	Total/NA	Solid	5030C	
MB 240-636461/1-A	Method Blank	Total/NA	Solid	5030C	
LCS 240-636461/2-A	Lab Control Sample	Total/NA	Solid	5030C	
240-215200-1 MS	EB-01 6-8'	Total/NA	Solid	5030C	
240-215200-1 MSD	EB-01 6-8'	Total/NA	Solid	5030C	

Analysis Batch: 636462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	8015D	636461
240-215200-2	EB-02 6-8'	Total/NA	Solid	8015D	636461
240-215200-3	EB-03 4-6'	Total/NA	Solid	8015D	636461
240-215200-4	EB-04 8-10'	Total/NA	Solid	8015D	636461
240-215200-5	EB-05 6-8'	Total/NA	Solid	8015D	636461
MB 240-636461/1-A	Method Blank	Total/NA	Solid	8015D	636461
LCS 240-636461/2-A	Lab Control Sample	Total/NA	Solid	8015D	636461
240-215200-1 MS	EB-01 6-8'	Total/NA	Solid	8015D	636461
240-215200-1 MSD	EB-01 6-8'	Total/NA	Solid	8015D	636461

GC Semi VOA

Analysis Batch: 635993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-636055/1-A	Method Blank	Total/NA	Solid	8015D	636055
LCS 240-636055/2-A	Lab Control Sample	Total/NA	Solid	8015D	636055

Analysis Batch: 635995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	8015D	636055
240-215200-2	EB-02 6-8'	Total/NA	Solid	8015D	636055
240-215200-3	EB-03 4-6'	Total/NA	Solid	8015D	636055

Analysis Batch: 635996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-4	EB-04 8-10'	Total/NA	Solid	8015D	636055
240-215200-5	EB-05 6-8'	Total/NA	Solid	8015D	636055

Prep Batch: 636032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	3546	
240-215200-2	EB-02 6-8'	Total/NA	Solid	3546	
240-215200-3	EB-03 4-6'	Total/NA	Solid	3546	
240-215200-4	EB-04 8-10'	Total/NA	Solid	3546	
240-215200-5	EB-05 6-8'	Total/NA	Solid	3546	
MB 240-636032/1-A	Method Blank	Total/NA	Solid	3546	
LCS 240-636032/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 636041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	8082A	636032
240-215200-2	EB-02 6-8'	Total/NA	Solid	8082A	636032

GC Semi VOA (Continued)

Analysis Batch: 636041 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-3	EB-03 4-6'	Total/NA	Solid	8082A	636032
240-215200-4	EB-04 8-10'	Total/NA	Solid	8082A	636032
240-215200-5	EB-05 6-8'	Total/NA	Solid	8082A	636032
MB 240-636032/1-A	Method Blank	Total/NA	Solid	8082A	636032
LCS 240-636032/2-A	Lab Control Sample	Total/NA	Solid	8082A	636032

Prep Batch: 636055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	3546	
240-215200-2	EB-02 6-8'	Total/NA	Solid	3546	
240-215200-3	EB-03 4-6'	Total/NA	Solid	3546	
240-215200-4	EB-04 8-10'	Total/NA	Solid	3546	
240-215200-5	EB-05 6-8'	Total/NA	Solid	3546	
MB 240-636055/1-A	Method Blank	Total/NA	Solid	3546	
LCS 240-636055/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 636784

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-3	EB-03 4-6'	Total/NA	Solid	8015D	636055

General Chemistry

Analysis Batch: 635927

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-215200-1	EB-01 6-8'	Total/NA	Solid	Moisture	
240-215200-2	EB-02 6-8'	Total/NA	Solid	Moisture	
240-215200-3	EB-03 4-6'	Total/NA	Solid	Moisture	
240-215200-4	EB-04 8-10'	Total/NA	Solid	Moisture	
240-215200-5	EB-05 6-8'	Total/NA	Solid	Moisture	
240-215200-1 DU	EB-01 6-8'	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-01 6-8'
Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			636114	TJL2	EET CLE	11/20/24 15:25
Total/NA	Analysis	8260D		1	636091	TJL2	EET CLE	11/20/24 16:42
Total/NA	Prep	3546			636025	NPR	EET CLE	11/20/24 09:22
Total/NA	Analysis	8270E		1	636140	LKG	EET CLE	11/21/24 11:34
Total/NA	Prep	5030C			636461	JBN	EET CLE	11/23/24 09:00
Total/NA	Analysis	8015D		1	636462	JBN	EET CLE	11/23/24 13:18
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		1	635995	XFP	EET CLE	11/20/24 14:58
Total/NA	Analysis	Moisture		1	635927	C5SV	EET CLE	11/19/24 14:46

Client Sample ID: EB-01 6-8'
Date Collected: 11/15/24 11:35
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-1
Matrix: Solid
Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			636032	BV1	EET CLE	11/20/24 09:31
Total/NA	Analysis	8082A		1	636041	MBB	EET CLE	11/20/24 16:58

Client Sample ID: EB-02 6-8'
Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			636114	TJL2	EET CLE	11/20/24 15:25
Total/NA	Analysis	8260D		1	636091	TJL2	EET CLE	11/20/24 17:04
Total/NA	Prep	3546			636025	NPR	EET CLE	11/20/24 09:22
Total/NA	Analysis	8270E		1	636140	LKG	EET CLE	11/21/24 12:46
Total/NA	Prep	5030C			636461	JBN	EET CLE	11/23/24 09:00
Total/NA	Analysis	8015D		1	636462	JBN	EET CLE	11/23/24 15:01
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		1	635995	XFP	EET CLE	11/20/24 15:25
Total/NA	Analysis	Moisture		1	635927	C5SV	EET CLE	11/19/24 14:46

Client Sample ID: EB-02 6-8'
Date Collected: 11/15/24 13:00
Date Received: 11/19/24 08:00

Lab Sample ID: 240-215200-2
Matrix: Solid
Percent Solids: 84.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			636032	BV1	EET CLE	11/20/24 09:31
Total/NA	Analysis	8082A		1	636041	MBB	EET CLE	11/20/24 17:12

Lab Chronicle

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-03 4-6'

Lab Sample ID: 240-215200-3

Date Collected: 11/15/24 13:40

Matrix: Solid

Date Received: 11/19/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			636114	TJL2	EET CLE	11/20/24 15:25
Total/NA	Analysis	8260D		1	636091	TJL2	EET CLE	11/20/24 17:25
Total/NA	Prep	3546			636025	NPR	EET CLE	11/20/24 09:22
Total/NA	Analysis	8270E		2	636140	LKG	EET CLE	11/21/24 13:10
Total/NA	Prep	5030C			636461	JBN	EET CLE	11/23/24 09:00
Total/NA	Analysis	8015D		1	636462	JBN	EET CLE	11/23/24 15:35
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		5	636784	XFP	EET CLE	11/26/24 17:26
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		1	635995	XFP	EET CLE	11/20/24 15:51
Total/NA	Analysis	Moisture		1	635927	C5SV	EET CLE	11/19/24 14:46

Client Sample ID: EB-03 4-6'

Lab Sample ID: 240-215200-3

Date Collected: 11/15/24 13:40

Matrix: Solid

Date Received: 11/19/24 08:00

Percent Solids: 81.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			636032	BV1	EET CLE	11/20/24 09:31
Total/NA	Analysis	8082A		1	636041	MBB	EET CLE	11/20/24 17:26

Client Sample ID: EB-04 8-10'

Lab Sample ID: 240-215200-4

Date Collected: 11/15/24 16:05

Matrix: Solid

Date Received: 11/19/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			636114	TJL2	EET CLE	11/20/24 15:25
Total/NA	Analysis	8260D		1	636091	TJL2	EET CLE	11/20/24 17:46
Total/NA	Prep	3546			636025	NPR	EET CLE	11/20/24 09:22
Total/NA	Analysis	8270E		1	636140	LKG	EET CLE	11/21/24 13:33
Total/NA	Prep	5030C			636461	JBN	EET CLE	11/23/24 09:00
Total/NA	Analysis	8015D		1	636462	JBN	EET CLE	11/23/24 16:10
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		1	635996	XFP	EET CLE	11/20/24 14:58
Total/NA	Analysis	Moisture		1	635927	C5SV	EET CLE	11/19/24 14:46

Client Sample ID: EB-04 8-10'

Lab Sample ID: 240-215200-4

Date Collected: 11/15/24 16:05

Matrix: Solid

Date Received: 11/19/24 08:00

Percent Solids: 80.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			636032	BV1	EET CLE	11/20/24 09:31
Total/NA	Analysis	8082A		1	636041	MBB	EET CLE	11/20/24 17:40

Lab Chronicle

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Client Sample ID: EB-05 6-8'

Lab Sample ID: 240-215200-5

Date Collected: 11/15/24 16:58

Matrix: Solid

Date Received: 11/19/24 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5030C			636114	TJL2	EET CLE	11/20/24 15:25
Total/NA	Analysis	8260D		1	636091	TJL2	EET CLE	11/20/24 18:08
Total/NA	Prep	3546			636025	NPR	EET CLE	11/20/24 09:22
Total/NA	Analysis	8270E		1	636140	LKG	EET CLE	11/21/24 13:57
Total/NA	Prep	5030C			636461	JBN	EET CLE	11/23/24 09:00
Total/NA	Analysis	8015D		1	636462	JBN	EET CLE	11/23/24 16:45
Total/NA	Prep	3546			636055	BV1	EET CLE	11/20/24 10:33
Total/NA	Analysis	8015D		1	635996	XFP	EET CLE	11/20/24 15:25
Total/NA	Analysis	Moisture		1	635927	C5SV	EET CLE	11/19/24 14:46

Client Sample ID: EB-05 6-8'

Lab Sample ID: 240-215200-5

Date Collected: 11/15/24 16:58

Matrix: Solid

Date Received: 11/19/24 08:00

Percent Solids: 85.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			636032	BV1	EET CLE	11/20/24 09:31
Total/NA	Analysis	8082A		1	636041	MBB	EET CLE	11/20/24 17:55

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

Client: Resource International Inc
Project/Site: ODOT Preble Co.

Job ID: 240-215200-1

Laboratory: Eurofins Cleveland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-28-25
Connecticut	State	PH-0806	12-31-26
Georgia	State	4062	02-27-25
Illinois	NELAP	200004	08-31-25
Iowa	State	421	06-01-25
Kentucky (UST)	State	112225	02-27-25
Kentucky (WW)	State	KY98016	12-30-24
Minnesota	NELAP	039-999-348	12-31-25
New Hampshire	NELAP	225024	09-30-25
New Jersey	NELAP	OH001	07-03-25
New York	NELAP	10975	04-02-25
Ohio VAP	State	ORELAP 4062	02-27-25
Oregon	NELAP	4062	02-27-25
Pennsylvania	NELAP	68-00340	08-31-25
Texas	NELAP	T104704517-22-19	08-31-25
USDA	US Federal Programs	P330-18-00281	01-05-27
Virginia	NELAP	460175	09-14-25
West Virginia DEP	State	210	12-31-24

Eurofins Eaton Analyitcal: South Bend
110 South Hill Street
South Bend, IN 46617
Phone (574) 233-4777

0.311.0

Chain of Custody Record

Columbus 209

eurofins | Environment Testing America

Client Information	Sampler: Zachary Hamilton	Lab PM: Nicole Kalis	Carrier Tracking No(s):	COC No:
Client Contact: Michelle Eckels	Phone: 330.313.4651	E-Mail:	State of Origin: OH	Page: Page 1 of 1
Company: Resource International Inc.	PWSID:			Job #:
Address: 6350 Presidential Gateway	Due Date Requested:			
City: Columbus OH 43231	TAT Requested (days): Standard			
State, Zip: OH 43231	Compliance Project: Δ Yes Δ No			
Phone: 614 823-4949	PO #:			
Email: MichelleE@resourceinternational.com	WO #:			
Project Name: ODOT Preble Co.	Project #: B-24-018			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	VOCs 8260	SVOCs 8270	TPH 8015 GRO, DRO, ORO	PCBs 8082	Total Number of containers	Special Instructions/Note:
Preservation Code:												
EB-01	11.15.2024		Gr	Soil			X	X	X	X		
EB-02	↓		↓	↓			X	X	X	X		
EB-03							X	X	X	X		
EB-04							X	X	X	X		
EB-05							X	X	X	X		

240-215200 COC

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]		RI	Cameron Mosley	11/18/24 15:04	Eurofins
2	Cameron Mosley	11/18/24 1700	Eurofins	JMOROSKO	11/19/24 1025	Eurofins
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 02/24/23

Eurofins – Cleveland Sample Receipt Form/Narrative **Login # :** _____
Barberton Facility

Client Resource International Site Name _____ Cooler unpacked by: JMOROSKO

Cooler Received on 11/19/24 Opened on 11/19/24

FedEx: 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

Eurofins Cooler # EC Foam Box Client Cooler Box Other _____

Packing material used. Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN # 13 (CF 0.7 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp 1.0 °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5 Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7 Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N) and sample type of grab/comp (Y/N)?		
10 Were correct bottle(s) used for the test(s) indicated?	Yes	No
11 Sufficient quantity received to perform indicated analyses?	Yes	No
12 Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC448976
14 Were VOAs on the COC?	Yes	No
15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	No NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17 Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no time on COC or bottles logging all sample time as 0000 (GR)

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

11/19/2024

Login Container Summary Report

240-215200

12/26/2024 (Rev. 2)

Temperature readings. _____

Client Sample ID	Lab ID	Container Type	Container pH	Container Temp	Preservation Added	Preservation Lot Number
EB-01	240-215200-A-1	SnapCap 1/2 ounce unpreserved				
EB-01	240-215200-B-1	Soil jar 2oz - clear glass				
EB-01	240-215200-C-1	Soil jar 4oz - clear glass				
EB-01	240-215200-D-1	Soil jar 4oz - clear glass				
EB-02	240-215200-A-2	SnapCap 1/2 ounce unpreserved				
EB-02	240-215200-B-2	Soil jar 2oz - clear glass				
EB-02	240-215200-C-2	Soil jar 4oz - clear glass				
EB-02	240-215200-D-2	Soil jar 4oz - clear glass				
EB-03	240-215200-A-3	SnapCap 1/2 ounce unpreserved				
EB-03	240-215200-B-3	Soil jar 2oz - clear glass				
EB-03	240-215200-C-3	Soil jar 4oz - clear glass				
EB-03	240-215200-D-3	Soil jar 4oz - clear glass				
EB-04	240-215200-A-4	SnapCap 1/2 ounce unpreserved				
EB-04	240-215200-B-4	Soil jar 2oz - clear glass				
EB-04	240-215200-C-4	Soil jar 4oz - clear glass				
EB-04	240-215200-D-4	Soil jar 4oz - clear glass				
EB-05	240-215200-A-5	SnapCap 1/2 ounce unpreserved				
EB-05	240-215200-B-5	Soil jar 2oz - clear glass				
EB-05	240-215200-C-5	Soil jar 4oz - clear glass				
EB-05	240-215200-D-5	Soil jar 4oz - clear glass				

SECTION 00 31 26 EXISTING HAZARDOUS MATERIAL INFORMATION

DOT-200011
ODOT PREBLE FULL SERVICE MAINTENANCE FACILITY
234 QUAKER TRACE ROAD
WEST ALEXANDRIA, OHIO

HAZARDOUS MATERIALS SURVEY

Prepared for:
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202

Prepared By:
Resource International, Inc.
6350 Presidential Gateway
Columbus, Ohio 43231

Rii Project # B-24-018

October 2024

RESOURCE INTERNATIONAL, INC.
6350 Presidential Gateway
Columbus, Ohio 43231
Ph: 614.823.4949
Fx: 614.823.4990

October 2, 2024

Chad R. Kohler, AIA, NCARB
Architectural Practice Lead
Burgess & Niple, Inc.
525 Vine Street, Suite 1300
Cincinnati, Ohio 45202
phone: 513.579.0042

Re: Hazardous Materials Survey
DOT-200011
ODOT Preble Full-Service Maintenance Facility
234 Quaker Trace Road, West Alexandria, Ohio 45381
Rii Project # B-24-018

Dear Mr. Kohler:

Resource International, Inc. (Rii) is submitting this Hazardous Materials Survey for the ODOT Preble Full-Service Maintenance Facility project, located at 234 Quaker Trace Road in West Alexandria, Ohio 45381.

Our conclusions and recommendations are presented in their entirety in Section 6.0. The entire report should be read to obtain a more complete understanding of the information provided, and to aid in any decisions made or actions taken based on our findings and conclusions.

If you have any questions concerning this report, please contact Michelle Eckels at 614-823-4949 or email at michellee@resourceinternational.com.

Sincerely,
RESOURCE INTERNATIONAL, INC.

Michelle L Eckels

Michelle L. Eckels, CPG
Vice President – Environmental Services

Attachment: Hazardous Materials Report

ISO 9001: 2015 QMS
Committed to providing a high quality, accurate service in a timely manner

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EXECUTIVE SUMMARY

Burgess & Niple, Inc. retained Resource International, Inc. (Rii) to conduct a hazardous materials survey of the existing buildings at the Ohio Department of Transportation (ODOT) Preble County Full-Service Maintenance Facility located at 234 Quaker Trace Road in West Alexandria, Ohio. The hazardous materials survey included the assessment for the presence of asbestos-containing materials (ACM), and lead-, cadmium-, chromium-, and arsenic-based paint (LBP), PCBs and mercury equipment identified during the sampling and evaluation that potentially will be disturbed as part of renovation/demolition activities.

Several ACMs were identified in the Office Building/Garage; however, no ACMs were identified in the Mobile Trailer, Small Pump Structure, Salt Dome Building, Sand/Salt Building or the Pole Barn. As the identified ACM is to be disturbed, proper asbestos abatement procedures should be implemented prior to the commencement of all renovation/demolition work. Since demolition of buildings and disturbance of ACM is proposed for this project, the owner of the facility must follow the Ohio EPA standards for notification of demolition and renovation work.

Several painted components throughout the facility were identified to have LBP and/or hazardous coatings. Renovations and/or demolition will require the contractor and subcontractors to address worker exposure where these painted/coated surfaces are going to be disturbed. Ohio EPA's Ohio-Specific Universal Waste rules allow hazardous paint-related waste to be classified as a universal waste in Ohio under OAC Chapter 3745-273. For disposal purposes, hazardous paint-related waste must still be classified through analytical testing as hazardous or non-hazardous to determine the destination facility.

An inventory of additional regulated materials was conducted, which identified potential PCB and mercury-containing equipment throughout the facility. If the identified equipment is proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods.

Please refer to Section 6.0 for conclusions and recommendations for proper management and disposal of the materials and equipment. The entire report should be read to obtain a full understanding in order to make informed business decisions about the structures.

1.0 INTRODUCTION

1.1 GENERAL

Burgess & Niple, Inc. retained Resource International, Inc. (Rii) to conduct a hazardous materials survey of the existing buildings at the Ohio Department of Transportation (ODOT) Preble County Full-Service Maintenance Facility located at 234 Quaker Trace Road in West Alexandria, Ohio. The hazardous materials survey included the assessment for the presence of asbestos-containing materials (ACM), lead-, cadmium-, chromium-, and arsenic-based paint (LBP), PCBs and mercury equipment identified during the sampling and evaluation that potentially will be disturbed as part of renovation/demolition activities. Refer to the site location maps as Figures 1 and 2 in Appendix A.

1.2 SITE SUMMARY

The design work includes a hazardous materials assessment of existing building materials within the following structures at the ODOT Preble County Full-Service Maintenance Facility:

- Office Building/Garage: 15,642 square feet, built in 1972.
- Salt Dome Building: 8,020 square feet, built in 1980.
- Sand/Salt Building: 2,208 square feet, built in 1972.
- Mobile Trailer: 660 square feet, built in 2011.
- Pole Barn: 3,160 square feet, built in 1972.
- Small Pump Structure: 120 square feet, built in 2011.

2.0 ASBESTOS SURVEY

2.1 REGULATORY FRAMEWORK AND SURVEY APPROACH

The asbestos building survey was conducted to determine if ACM is present within the structures to be disturbed during renovation and to comply with the National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61 Subpart M – National Emission Standard for Asbestos), the Occupational Safety and Health Administration (OSHA) asbestos standard (29 CFR 1910.1001), and the Ohio Environmental Protection Agency (Ohio EPA) Ohio Asbestos Emission Control Rules (Ohio Administrative Code [OAC] 3745-20). The NESHAP requires an asbestos survey prior to demolition or renovation, and classification of suspect materials into *Category I nonfriable ACM*, *Category II nonfriable ACM*, or *Regulated ACM (RACM)*.

The Ohio EPA requires notification when buildings are demolished and when renovation activities disturb specific quantities of ACM. For regulatory purposes, a material is considered ACM by EPA if it contains more than 1% asbestos, and a material is considered as asbestos-containing by OSHA if it contains any percent of asbestos, including less than 1% asbestos.

Building materials per area suspect to be asbestos-containing were inspected and grouped as homogeneous if uniform in texture, color, date of application, and appears identical in other respects. A total of sixty-seven (67) homogeneous area ACMs from the structures were visually inspected and sampled during the field inspections. The following table is a list of homogeneous building materials initially suspect to be ACM.

TABLE 1 – SUSPECT ASBESTOS-CONTAINING MATERIALS

Material Code	Homogeneous Material Description
MOBILE TRAILER (MT)	
MT1	Fiberglass wall insulation – light yellow
MT2	Drywall – ceiling
MT3	Textured finish – ceiling
MT4	Fiberglass wall insulation - yellow
MT5	Fiberglass duct insulation - yellow
MT6	12”x12” Floor tile – tan & gray
MT7	Clear mastic
MT8	Window caulk - white
MT9	Gray caulk
MT10	Silver roof sealant
MT11	Silicone caulk - black

Material Code	Homogeneous Material Description
SMALL PUMP STRUCTURE (SP)	
SP1	Yellow foam insulation
SALT DOME BUILDING (SD)	
SD1	Asphalt shingle
SD2	Tar paper
OFFICE BUILDING/GARAGE (OB)	
OB1	White membrane
OB2	Roof tar
OB3	Blue Styrofoam
OB4	Brown fiber board
OB5	Brown caulk – Roof
OB6	Pipe caulk – white & tan
OB7	Pipe caulk – red
OB8	Tan & white caulk
OB9	12”x12” Floor tile – tan w/ brown
OB10	Black mastic
OB11	Cove base – brown
OB12	Yellow mastic
OB13	2’x4’ Ceiling tile - textured
OB14	2’x4’ Ceiling tile – random perforations
OB15	12”x12” Floor tile – tan with gray
OB16	Brown mastic
OB17	Black caulk
OB18	Blue pipe sealant
OB19	Brown fiber board
OB20	White vinyl
OB21	Gray caulk
OB22	Gray epoxy floor coating
OB23	Tan door caulk
OB24	Gray floor caulk
OB25	Cove base – dark brown
OB26	Tan mastic
OB27	Fiberglass pipe insulation – yellow
OB28	Pipe end sealant
OB29	Cloth wrap
OB30	2’x4’ Ceiling tile – pinholes

Material Code	Homogeneous Material Description
OB31	Gray caulk - flexible
OB32	Gray caulk - hard
OB33	Gray window glazing – interior
OB34	Gray window glazing – exterior
OB35	Gray window glazing (door)
OB36	Joint compound – white
OB37	Drywall
OB38	Window mortar
OB39	Duct mastic - brown
OB40	Gray epoxy floor coating – with white flecks
OB41	White caulk – window
OB42	White caulk – door
OB43	Red door caulk
OB44	Black expansion joint
OB45	Gray caulk
OB46	Brown caulk – window
OB47	Black caulk – door frame
OB48	White caulk – security glass
OB49	Black expansion joint
OB50	Pipe end sealant
OB51	Cloth wrap
OB52	Gray pipe cement
OB53	Fiberglass pipe insulation - yellow

Interior materials suspected of containing asbestos must be categorized in accordance with Asbestos Hazard Emergency Response Act (AHERA, 40 CFR Part 763) as one (1) of the following three (3) types:

1. **Surfacing Materials** – Interior ACM that has been sprayed on, troweled on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

2. **Thermal System Insulation (TSI)** – Insulation applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

3. **Miscellaneous Materials** – Interior building materials on structural components,

structural members or fixtures, such as floor ceiling tiles. "Miscellaneous materials" do not include TSI or surfacing materials.

AHERA requires a minimum number of samples to be collected based on linear and square footage to demonstrate that a homogeneous area is non-ACM. The following bulk sampling requirements were used in determining the number of samples necessary to obtain from a homogeneous material.

BULK SAMPLING REQUIREMENTS	
Type of Material	**Minimum Samples Recommended**
Friable Surfacing Material	
• Area ≤ 1,000 sq ft	3
• Area > 1,000 sq ft but ≤ 5,000 sq ft	5
• Area > 5,000 sq ft	7
Thermal System Insulation (TSI)	
• Homogeneous area of TSI	3
• Patched TSI (if patched section < 6 linear or sq ft	1
• Each insulated area of insulating cement (mudded fittings such as elbows, tees or valves)	Sufficient number of samples determined by Inspector (usually 2-3)
Friable Miscellaneous Material	Sufficient number of samples determined by Inspector (usually 2-3)
Nonfriable Suspected ACM	Sufficient number of samples determined by Inspector (usually 2-3)

In accordance with AHERA, the quantity of friable surfacing materials determines the minimum number of samples that the inspector must obtain for the survey.

2.2 ANALYTICAL RESULTS

A certified Asbestos Hazard Evaluation Specialist (AHES) visually inspected the suspect materials, identified to determine the presence of ACM. The AHES inspectors included Katie Bossert (Certification #ES549481) and Zachary Hamilton (Certification #ES34150). The field sampling was conducted on August 12 & 19, 2024. Materials identified as suspect ACM were bulk sampled for laboratory analysis to determine asbestos content, in accordance with 40 CFR 763.86. The survey was conducted on only the structures proposed for renovation/demolition as part of this project.

Each suspect ACM was touched to determine whether the material was friable or nonfriable, and the condition of each suspect ACM was documented. Whenever possible,

reasonably ascertainable quantities of suspect ACM were visually observed and recorded.

The bulk samples were placed in plastic bags, sealed and labeled with a unique sample identification number and a description of material. The bulk samples were submitted to EMSL Analytical, Inc. (EMSL) in Cinnaminson, New Jersey, for analysis using polarized light microscopy (PLM). EMSL is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) for conducting asbestos analysis using PLM. The PLM analysis was performed in accordance with the Environmental Protection Agency (EPA) Method 600/R-93/116, as outlined in 40 CFR 763.109 Appendix A. A chain-of-custody was prepared to accompany bulk samples to the laboratory.

When a bulk sample has tested positive for the presence of asbestos, and the percentage is 10% or lower, the point count method can be performed on the sample. Point counting provides a determination of the area percentage of asbestos in a sample, with a detection limit of 0.25% asbestos.

Refer to Table 2 for a summary of the asbestos samples that were obtained, results, and the location of the samples. The table is provided in the table section at the end of this report. Room numbers and sample locations are provided on Figures 3-6 in Appendix A. Copies of the laboratory analytical results can be found in Appendix C.

During this investigation using the PLM method of analysis, the following homogeneous materials from the buildings assessed for this project were identified as having detectable asbestos fibers.

TABLE 3 - CONFIRMED

ASBESTOS-CONTAINING MATERIALS

Material Code	Homogeneous Material Description
MOBILE TRAILER (MT)	
No ACM was identified	
SMALL PUMP STRUCTURE (SP)	
No ACM was identified	
SALT DOME BUILDING (SD)	
No ACM was identified	
SAND/SALT BUILDING (SS)	
No Suspect ACM was observed	
POLE BARN (PB)	
No Suspect ACM was observed	
OFFICE BUILDING/GARAGE (OB)	
OB5	Brown caulk – Roof
OB9	12”x12” Floor tile – tan with brown
OB23	Tan door caulk
OB31	Gray caulk – flexible (door frame)
OB32	Gray caulk – hard (door frame)
OB33	Gray window glazing – interior
OB34	Gray window glazing – exterior
OB40	Gray epoxy floor coating – with white flecks
OB46	Brown caulk – window
OB47	Black caulk – door frame
OB48	White caulk – security glass

Loose fill vermiculite has historically been used as insular fill in concrete block walls, and vermiculite mines may contain natural deposits of asbestos. Therefore, the concrete masonry walls of the buildings were cored with a drill and no vermiculite was observed.

2.3 ASBESTOS CLASSIFICATIONS

ACMs are classified as either Category I nonfriable, Category II nonfriable, or Regulated Asbestos-containing Material (RACM) in accordance with the Ohio Administrative Code (OAC) 3745-20-01 and the NESHAP 40 CFR Part 61.141, Subpart M. Refer to below for a definition of each classification:

- **Category I Nonfriable ACM** – Asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products containing more than 1 percent asbestos as determined using Polarized Light Microscopy, as specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1.

- **Category II Nonfriable ACM** – Any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using Polarized Light Microscopy, as specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

- **Regulated ACM (RACM)** –

  a) Friable asbestos material;
  b) Category I nonfriable ACM that has become friable;
  c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or
  d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by 40 CFR Part 61.

3.0 LEAD, CADMIUM, CHROMIUM, AND ARSENIC PAINT SURVEY

The paint survey was conducted on August 12, 2024 by Katie Bossert and Zachary Hamilton (Innov-X Systems Radiation Safety Operators). The survey was conducted on only the structures proposed for renovation/demolition as part of this project.

The inspection was performed using an X-Ray Fluorescence (XRF) device manufactured by Innov-X. Currently, there are no federal or state regulations that specifically identify testing procedures via XRF in non-residential buildings. Rii followed the manufacturer's testing methodology for procedures, and inspectors were trained in the use, calibration and maintenance of the XRF equipment, along with the necessary principles of radiation safety.

3.1 TESTING PROCEDURES

3.1.1 XRF FIELD TESTING

The XRF Analyzer is a complete lead paint coating analysis system which quickly, accurately, and non-destructively measures the concentration of lead, cadmium, chromium, and arsenic on surfaces. The XRF relies on the measurement of the K-shell X-rays to determine the amount of lead present on the painted surface. K-shell X-rays can penetrate many layers of paint/coating and allow for a good measurement of the metal content to be made without being significantly affected by the thickness or number of layers of paint on the surface of the sample. Immediately prior to initiating field testing, once every (4) four hours, and after the day's inspection work was completed, a "validation test" was performed to assure that the instrument was operating properly.

3.2 LEAD PAINT RESULTS

The US Environmental Protection Agency (EPA) defines lead-based paint (40 CFR 745.103) as paint containing lead levels equal to or greater than 1.0 mg/cm^2 when measured by field XRF analyzers, 5,000 ppm or 0.5% by weight when analyzed by atomic absorption spectroscopy (AAS). The Occupational Safety and Health Administration (OSHA) does not define lead-based paint, nor does it acknowledge any intrinsically safe levels of lead in paint.

Testing for lead-based paint was performed on a representative number of painted components in the areas scheduled for renovation. Rii determined that the components identified in Table 4 – Identified Lead-Based Paint contains lead-based paint on the surfaces tested. Copies of the analytical results can be found in Appendix C.

TABLE 4 – IDENTIFIED LEAD-BASED PAINT

Building	Lead-based Paint and Surfaces
Office Building/Garage	• Red tire rack • Dark gray and red I-beams and columns • Brown fire cabinet • White main switch panel • Red/orange exterior bollards
Salt Building (Dome)	• No lead-based paint identified
Sand/Salt Building	• Brown I-beams and columns
Mobile Trailer	• No lead-based paint identified
Pole Barn	• Gray plywood storage bin
Small Pump Structure	• No lead-based paint identified

Paint with varying levels of lead, including trace levels of lead at low levels (less than 1.0 mg/cm^2, or 0.5% or 5,000 ppm by weight) was identified on various components throughout the building. These components may create lead dust if the paint is turned into dust by abrasion, scraping or sanding. The complete lead-based paint results are located in Appendix C.

3.3 CADMIUM RESULTS

Testing for cadmium coating was performed on a representative number of painted components in the areas scheduled for paint removal and demolition. Rii determined that the no components contain cadmium coating on the surfaces tested. The complete XRF cadmium coating results are located in Appendix C.

TABLE 5 – CADMIUM RESULTS

Building	Cadmium Coatings and Surfaces
Office Building/Garage	• No cadmium coatings identified
Salt Building (Dome)	• No cadmium coatings identified
Sand/Salt Building	• No cadmium coatings identified
Mobile Trailer	• No cadmium coatings identified
Pole Barn	• No cadmium coatings identified

Building	Cadmium Coatings and Surfaces
Small Pump Structure	• No cadmium coatings identified

If there is a potential for employee exposure to cadmium vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 2.5 µg/m^3.

3.4 CHROMIUM RESULTS

Testing for chromium coating was performed on a representative number of painted components in the areas scheduled for paint removal and demolition. Rii determined that the following components contain chromium coating on the surfaces tested:

TABLE 6 – CHROMIUM RESULTS

Building	Chromium Coatings and Surfaces
Office Building/Garage	• Brown window frames • Brown picnic table • Brown, tan and cream doors • Gray and green cement floors • Gray CMU walls • Green wood work station • Red tire rack • Dark gray and red I-beams and columns • Brown metal file cabinet • Brown exterior piping • Gray overhead garage doors • White downspouts
Salt Building (Dome)	• No chromium coatings identified
Sand/Salt Building	• Brown I-beams and columns
Mobile Trailer	• Taupe aluminum siding • White aluminum trim • Dark brown window frames • Tan aluminum trailer skirt • White doors
Pole Barn	• White downspouts • Tan and gray aluminum siding • Brown plank wall
Small Pump Structure	• Dark blue pump motor

Building components containing chromium coatings may create chromium dust if the paint is turned into dust by abrasion, scraping or sanding, or vapors by torch cutting. The complete XRF chromium coating results are located in Appendix C.

If there is a potential for employee exposure to chromium vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 2.5 µg/m^3.

3.5 ARSENIC RESULTS

Testing for arsenic coating was performed on a representative number of painted components in the areas scheduled for paint removal and demolition. Rii determined that the following components contain arsenic coating on the surfaces tested:

TABLE 7 – ARSENIC RESULTS

Building	Arsenic Coatings and Surfaces
Office Building/Garage	• Tan, gray, green, red, black and white CMU walls • Tan drywall walls • Blue, brown, gray, green and cream doors • Brown/tan/white window and door frames • Brown picnic table • Gray and green concrete floor • White heater unit • Red vehicle lift • Green wood work station • Yellow striping paint • Dark gray staircase • Gray pipe insulation • Blue pump valve • Brown exterior piping
Salt Building (Dome)	• No arsenic coatings identified
Sand/Salt Building	• No arsenic coatings identified
Mobile Trailer	• Taupe aluminum siding • Dark brown window frames • White drywall ceiling • Brown door trim
Pole Barn	• White plywood walls • Gray storage bin • Brown plank wall
Small Pump Structure	• Black hydraulic tank • White heater unit

Building components containing arsenic coatings may create arsenic dust if the paint is turned into dust by abrasion, scraping or sanding, or vapors by torch cutting. The complete XRF arsenic coating results are located in Appendix C.

If there is a potential for employee exposure to arsenic vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 5 µg/m^3.

3.5 LIMITATIONS

The scope of this inspection is limited to building components that were visible to the inspector/risk assessor at the time of the inspection. The project scope does not include components that may have been concealed from sight by irregular construction practices, or hidden by temporary procedures used to secure the unit or other circumstances that would prevent visual inspection of the component. These areas should be considered to contain lead, cadmium, chromium, or arsenic paint, unless tested otherwise, and be treated and handled as such during future renovation/demolition activities.

4.0 ADDITIONAL REGULATED MATERIALS SURVEY

The PCB and mercury survey was performed on August 12, 2024 by Katie Bossert and Zachary Hamilton. The survey involved an inventory of suspect equipment and areas, and did not include sampling or analysis. This inspection was conducted on the equipment and structures proposed for renovation/demolition as part of this project.

4.1 PCBs SURVEY

4.1.1 PCB BALLAST

Polychlorinated biphenyls (PCBs) were used in electrical oil-filled equipment such as transformers and light ballasts, until the EPA banned the manufacture and use of PCBs in 1978. According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm). Ballasts manufactured after July 1978 are required to bear a “No PCBs” label indicating that they do not contain PCBs.

Metal halide and fluorescent light ballasts were observed within the project area. It should be assumed all ballasts are PCB-containing unless a “No PCBs” label is identified on the ballast during renovation activities. Under the Toxic Substance Control Act (TSCA), light ballasts containing PCBs should be sent to an EPA-approved chemical waste processing site and recycled. Light ballasts that do not contain PCBs are not regulated under TSCA. However, it should be assumed all ballasts are PCB containing unless a “No PCBs” label is identified on the ballast during renovation/demolition activities.

4.1.2 PCB TRANSFORMERS

A “PCB transformer” is a transformer that is known, or assumed, to contain PCBs at concentrations greater than 500 parts per million (ppm) and are subject to EPA regulations. “PCB-contaminated transformers” contain between 50 to 499 ppm and are subject to different EPA regulations. Wet transformers used dielectric fluid that may contain PCBs if manufactured between 1929 and 1977.

No wet transformers were observed within the portion of the structures proposed for renovation/demolition. Pole-mounted transformers were observed throughout the property, and were labeled as “Non-PCB”. The electric utility company would be responsible for any cleanup necessitated by spills or leaks of dielectric fluid from these units.

4.1.3 PCB HYDRAULIC OIL

An old lubricant tank, associated with the former grease rack, was present in the Generator Room (Room 14) and depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil. If hydraulic oil has greater than 50 ppm total

concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500 ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste.

4.2 MERCURY SURVEY

4.2.1 SUSPECT MERCURY EQUIPMENT

Fluorescent lamp tubes and metal halide lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Fluorescent lamp tubes are considered a regulated universal waste by the EPA. Mercury float switches may be present in the sump pump. Float switches may contain up to 2.5 ounces of mercury, and there could be multiple switches in a sump pump. The following suspect mercury equipment were identified within the project area:

- Fluorescent lamp tubes;
- Metal halide lamps
- Mercury thermostats;
- Mercury float switches; and
- Equipment gages and switches.

If mercury-containing equipment is to be removed as part of this project, they should be removed from the structure in good condition, and not be broken or crushed. The equipment should then be properly recycled or disposed of at a facility which is EPA-approved for receiving mercury-containing material.

4.3 MISCELLANEOUS REGULATED MATERIALS

Commercial truck batteries and battery-operated emergency exit signs were observed on the interior of the structures proposed for renovation/demolition. Sulfuric acid and lead are used in batteries and are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is prohibited in Ohio, and these batteries are required to be recycled at a licensed facility.

The Office Building/Garage building contained air-cooled condensing units with refrigerants. The refrigerants should be removed and recycled by an EPA-certified HVAC technician.

Electronic equipment was observed throughout the structures proposed for renovation/

demolition, and is considered as electronic waste if there is no intent for re-use or at the end of “useful” life. Typical electronic waste consists of screens, monitors, large equipment and appliances, IT and telecommunication equipment. Electronic equipment is considered a regulated waste if not recycled, and must be evaluated to determine if it exhibits a characteristic of hazardous waste. Per OAC 3745.51.02, electronic waste is not regulated as a hazardous waste if properly recycled.

Numerous containers of pesticides, paints, chemicals and petroleum products were observed stored throughout the facility. If these stored items are proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

Rii utilizes several procedures to ensure a high standard of care throughout the project. Such procedures include:

- Field staff includes a minimum of two (2) asbestos inspectors present during all site visits.
- All asbestos inspectors are State Certified Asbestos Hazard Evaluation Specialists.
- AHERA sampling procedures are followed, which includes strict protocols usually intended for educational facilities.
- Disposable nitrile gloves and new, sealable, plastic bags are used to minimize cross-contamination of samples.
- Sampling equipment is cleaned between uses with wet methods.
- Chain-of-custodies are completed after each survey, prior to transporting the samples to a laboratory for analysis.
- The laboratory used for the project is accredited by the National Institute of Standards and Technology under the National Voluntary Laboratory Accreditation Program (NVLAP).
- Laboratory staff checks the sample numbers with the chain-of-custody.
- A written report is developed by the team leader, and peer-reviewed by the project manager.
- The XRF instrument was calibrated by the rental company, IE Monitoring Equipment, prior to receipt.
- Rii standardized the instrument in the field prior to and after use.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 ASBESTOS

This Asbestos Survey was conducted in order to comply with the National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61 Subpart M) and the Ohio Environmental Protection Agency (Ohio EPA) Ohio Asbestos Emission Control Rules (Ohio Administrative Code [OAC] 3745-20). Refer to the Figures 1 and 2 in Appendix A for the site location.

The Ohio EPA requires notification when buildings are demolished and when renovation activities disturb specific quantities of ACM. For regulatory purposes, a material is considered ACM by EPA if it contains more than 1% asbestos, and a material is considered as asbestos-containing by OSHA if it contains any percent of asbestos, including less than 1% asbestos.

6.1.1 OHIO EPA REGULATED ACM

When using the PLM and point count method of analysis, several building materials within the project limits were identified as having detectable asbestos fibers of greater than 1%; therefore, are regulated by both the Ohio EPA and OSHA. Copies of the analytical results can be found in Appendix C. ACM sample locations are provided on Figures 3-6 in Appendix A. No ACM was identified in the Mobile Trailer, Small Pump Structure, Salt Dome Building, Sand/Salt Building or the Pole Barn.

TABLE 8 - ACM RESULTS

Location	ACM	HA Code	ACM Cat**	Approximate Quantity*
Office Building/Garage (OB)				
Room Nos. 1, 2, 3, 9, 10, 11 and 12	12”x12” Floor tile – tan with brown	OB9	Cat. I	1,900 sf
All single and double swinging doors throughout the structure	Tan door caulk	OB23	Cat. II	20 units
	Gray caulk – flexible (door frame)	OB31	Cat. II	
	Gray caulk – hard (door frame)	OB32	Cat. II	
	Black caulk – door frame	OB47	Cat. II	
Room Nos. 1, 2, 3, 4, 5 and 9	Gray window glazing – exterior	OB34	RACM	12 units
	Brown caulk – window	OB46	Cat. II	
Roof parapets and fascia	Brown caulk – Roof 2” strips	OB5	Cat. II	930 sf

*sf – square feet, lf – linear feet
**Category – Category I Nonfriable ACM (Cat. I), Cat. II Nonfriable ACM, Regulated ACM (RACM)

6.1.2 OSHA REGULATED ACM

When using the PLM method of analysis, **three (3) building materials** within the project limits were identified as having detectable asbestos fibers of less than 1%; and therefore, are only regulated by OSHA. Copies of the analytical results can be found in Appendix C.

TABLE 9 – <1% ACM RESULTS

Location	Sample Material	HA Code
Office Building/Garage (OB)		
Room Nos. 1, 2, 3, 4, 5 and 9	Gray window glazing – interior	OB33
Room No. 1 (entryway) and Room No. 4	Gray epoxy floor coating – with white flecks	OB40
Room Nos. 6, 7 and 8	White caulk – security glass	OB48

The project includes a hazardous materials survey of existing building materials in portions of the facility that will be undergoing renovations. During the site visit, additional materials that were suspected to contain asbestos were observed within the structures but were not sampled due to the location of the material, the potential danger to the sample collector and/or because of the integrity of the equipment/building component would have been compromised. In addition, the electrical could not be de-energized for sampling. If these items are to be dismantled, the components should be assumed as ACM or analyzed prior to disposal. Below is a list of items that are suspect to contain ACM:

- Pipe flange gaskets;
- Fire doors;
- Boiler insulation;
- Van Packer© breeching; and
- Electrical wiring, tape and equipment.

The materials identified above as suspect ACM should be evaluated during construction to identify the presence of ACM if the material is to be disturbed. The construction documents should be developed to address the contractor's procedures for conducting any further evaluation, if determined necessary based on the scope of the construction.

6.1.3 RECOMMENDATIONS

Ohio EPA Regulated ACM

As the identified ACM is to be disturbed, proper asbestos abatement procedures should be implemented prior to the commencement of all renovation/demolition work. All materials

identified as RACM, or may become RACM during renovation/demolition activities, and will be disturbed must be abated by a State of Ohio licensed abatement contractor, transported, and disposed of at an EPA licensed asbestos landfill.

Category I non-friable and some Category II non-friable ACM are not required to be removed prior to demolition, as long as the material does not become friable during the demolition process. If these materials become friable during the demolition process, then it should be treated as RACM and abated by a State of Ohio licensed abatement contractor.

When Category I non-friable ACM remains in the building during demolition, the building demolition debris cannot be recycled or used as fill and must be disposed of as construction demolition debris. When Category II non-friable ACM remains in the building during demolition, the entire building demolition debris must be disposed of at an EPA licensed asbestos landfill and follow appropriate OSHA requirements to protect workers and the public during demolition.

OSHA Regulated ACM

The interior window glazing, gray epoxy with white flecks floor coating, and white caulk on security glass windows were identified to contain less than 1% asbestos, and are not required to be removed prior to demolition. Trace levels of asbestos, or less than 1%, are not regulated by the Ohio EPA. However, these levels are regulated by OSHA and must be abated or demolished in a manner that will limit exposure. OSHA regulates all worker activities which impact materials with any amount of asbestos, including materials less than 1% asbestos containing. Thus, the contractor must abate or demolish the building in a method that will limit exposure and comply with OSHA regulations. To the extent practicable, ACM having concentrations of less than 1% should be handled in a manner which prevents the emission of airborne fibers to levels in excess of the workers permissible exposure limit (PEL). Demolition procedures used to satisfy OSHA should include wet methods for demolition. These methods also prohibit the use of high-speed abrasive disc saws or compressed air for cutting and materials removal. Please refer to OSHA guidance for applicable exposure limit regulations and demolition procedures associated with ACM.

6.1.4 Regulatory Notification of Renovation/Demolition

Per Ohio Environmental Protection Agency (Ohio EPA) regulations, A *Notification of Demolition and Renovation Form* must be completed and submitted at least ten (10) working days prior to the following activities:

- every **demolition** of a facility requires notification, regardless of whether asbestos is involved.

- every **renovation** of a facility must be submitted when the amount of regulated asbestos-containing material (RACM) stripped, removed, dislodged, cut, drilled, or similarly disturbed exceeds 260 linear feet on pipes or 160 square feet on other facility components or 35 cubic feet of other facility components.
- every **abatement**, when the activity involves the removal, renovation, enclosure, repair or encapsulation of friable asbestos-containing material in an amount greater than 50 linear feet on pipes or 50 square feet on other facility components.

Since demolition of buildings and disturbance of ACM is proposed for this project, the owner of the facility must follow the Ohio EPA standards for notification of demolition and renovation work. A copy of the *Ohio EPA Notification of Demolition and Renovation Form* is provided in Appendix E.

6.2 LEAD, CADMIUM, CHROMIUM, AND ARSENIC SURVEY

The paint survey was conducted on August 12, 2024 by Katie Bossert and Zachary Hamilton (Innov-X Systems Radiation Safety Operators). The inspection was performed using an X-Ray Fluorescence (XRF) device manufactured by Innov-X. At this time, there are no federal or state regulations that specifically identify testing procedures via XRF in non-residential buildings.

LEAD

Testing for lead-based paint was performed on a representative number of painted components in the areas scheduled for renovation. Lead-based paint was identified on surfaces throughout project areas. Refer to Table 4 – Lead Paint Results in Section 3.2 for a complete list of surfaces.

The US Environmental Protection Agency (EPA) defines lead-based paint (40 CFR 745.103) as paint containing lead levels equal to or greater than 1.0 mg/cm^2 when measured by field XRF analyzers, 5,000 ppm or 0.5% by weight. The Occupational Safety and Health Administration (OSHA) does not define lead-based paint, nor does it acknowledge any intrinsically safe levels of lead in paint.

Paint with varying levels of lead, including trace levels of lead at very low levels (less than 1.0 mg/cm^2, or 0.5% or 5,000 ppm by weight) was identified on various components throughout basement. These components may create lead dust if the paint is turned into dust by abrasion, scraping or sanding. The complete lead-based paint results are located in Appendix C.

CADMIUM

Cadmium coatings were identified on surfaces throughout the project areas. The complete XRF results are located in Appendix C. Refer to Table 5 – Cadmium Results in Section 3.3 for a complete list of surfaces.

If there is a potential for employee exposure to cadmium vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 2.5 µg/m^3.

CHROMIUM

Chromium coatings were identified on surfaces throughout the project areas. The complete XRF chromium coating results are located in Appendix C. Refer to Table 6 – Chromium Results in Section 3.4 for a complete list of surfaces.

These materials may create chromium dust if the coating is turned into dust by abrasion, scraping or sanding, or chromium vapors by torch cutting. If there is a potential for employee exposure to chromium vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 2.5 µg/m^3.

ARSENIC

Arsenic coatings were identified on surfaces throughout the project areas. The complete XRF arsenic coating results are located in Appendix C. Refer to Table 7 – Arsenic Results in Section 3.5 for a complete list of surfaces.

Building components containing arsenic coatings may create arsenic dust if the paint is turned into dust by abrasion, scraping or sanding, or vapors by torch cutting. If there is a potential for employee exposure to arsenic vapors or dust based on worker activities, OSHA requires air monitoring to determine whether exposure is at or above the action level of 5 µg/m^3.

6.2.1 WORKER PROTECTION

Worker safety should be as per OSHA Safety and Health Regulations for Construction, Lead Rule, 29 CFR 1926.62. The contractor should be made aware of the presence of lead and the field results should be made available. The contractor should also follow lead-safe work practices to reduce potential exposure to high levels of lead. Additionally, disposal and handling of the LBP material should be in accordance with all applicable governmental regulations.

The implications of lead paint and cadmium/chromium/arsenic coating existing in a building are related to the future use of the facility and the need to impact these painted surfaces during the renovation/demolition process. Renovations and/or demolition will require the contractor and subcontractors to address worker exposure where the surfaces coated with lead paint are going to be disturbed.

The OSHA Lead in Construction Standard located at 29 CFR 1926.62 regulates workers in construction, demolition, and maintenance who may be occupationally exposed to lead-

containing products. Lead-related construction work involves any construction, repair, painting, decorating, demolition, renovation, removal or encapsulation, alteration, installation of lead products, emergency cleanup, transportation, disposal, storage, containment, and maintenance work whereby the lead-containing material could be disturbed resulting in lead exposure.

The OSHA Chromium in Construction Standard located at 29 CFR 1910.1126 regulates workers in construction, demolition, and maintenance who may be occupationally exposed to chromium-containing products. Hexavalent chromium has been widely used in pigments, metal finishing, and wood preservatives. Chromium metal is often alloyed with other metals or plated on metal and plastic substrates to improve corrosion resistance and proved protective coatings.

The OSHA Cadmium in Construction Standard (29 CFR 1926.1127) regulates workers in construction, demolition, and maintenance who may be occupationally exposed to cadmium. Workers in many industries face potential exposure to cadmium; including electroplating, metal machining, plastics, ceramics, paint, and welding operations.

The OSHA Arsenic in Construction Standard (29 CFR 1926.1018) regulates workers in construction, demolition, and maintenance who may be occupationally exposed to cadmium. Workers in many industries face potential exposure to cadmium; including electroplating, metal machining, plastics, ceramics, paint, and welding operations.

OSHA defines any detectable concentration of lead paint or cadmium/chromium/arsenic coating as a **potential** exposure hazard to workers doing construction/demolition-type work on these surfaces as even small concentrations of metals can result in unacceptable employee exposures depending upon the method of removal and other workplace conditions. Since these conditions can vary greatly, the standard requires all employers to make an initial determination of whether any employee's exposure to lead exceeds the action level of 50 micrograms per cubic meter of air ($\mu g/m^3$) averaged over an 8-hour day, the action level of 2.5 $\mu g/m^3$ averaged over an 8-hour day for chromium and/or cadmium, and the action level of 5.0 $\mu g/m^3$ averaged over an 8-hour day for arsenic.

The exposure assessment involves sampling the air in the worker's breathing zone to determine exposure. Employee exposure is that exposure which would occur if the employee were not using a respirator. This initial determination requires the employer to monitor workers' exposures unless the employer has objective data that can demonstrate conclusively that no employee will be exposed to lead in excess of the action level. Where objective data is used in lieu of actual monitoring, the employer must establish and maintain an accurate record, documenting its relevancy in assessing exposure levels for current job conditions. If such objective data is available, the employer need proceed no further on employee exposure assessment until such time that conditions have changed and the determination is no longer valid.

However, if this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level; the employer must set up an air monitoring program to determine the exposure level representative of each employee exposed to lead in the workplace.

OSHA states that until the employer performs an exposure assessment (or can supply prior data regarding the same type of work which may exempt them from the standard) and documents that employees are not exposed above the permissible exposure limit (PEL), the employer must treat employees as if they were exposed above the PEL for the following operations:

- manual demolition of structures, manual scraping, manual sanding, and use of heat gun where hazardous coatings or paints are present;
- abrasive blasting enclosure movement and removal;
- power tool cleaning;
- lead burning;
- using hazardous mortar or spray paint;
- abrasive blasting, rivet busting, or welding, cutting, or burning on any structure where hazardous coatings or paint are present;
- cleanup activities where dry expendable abrasive are used; and
- any other task the employer believes may cause exposure in excess of the PEL.

This means providing respiratory protection, protective work clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until an exposure assessment has determined that the work activity will result in an exposure below the PEL. Additional requirements under this standard include a written compliance program as well as record keeping.

6.2.2 WASTE DISPOSAL

Waste disposal is governed by the Federal Resource Conservation and Recovery Act (RCRA) regulations, which distinguish between solid wastes and hazardous wastes. Solid wastes include general construction debris and are subject to minimum handling, transportation, and landfill disposal requirements under RCRA regulations. Hazardous wastes are subject to restrictions designed to prevent the hazardous materials from entering the environment.

As of December 21, 2017, Ohio EPA's Ohio-Specific Universal Waste rules allow hazardous paint-related waste to be classified as a universal waste in Ohio under OAC Chapter 3745-273. A universal waste is a unique category of hazardous waste that may be managed under less burdensome handler and transport requirements in the state of Ohio. The hazardous paint-related waste would not need to be managed and transported

as hazardous waste. Quantities would not count towards the hazardous waste generator status; which includes conditionally exempt small quantity generators (CESQGs), small quantity generators (SQGs) and large quantity generators (LQGs). Thus, hazardous waste manifesting would also not be required.

Under the Ohio EPA's Ohio-Specific Universal Waste rules, there are two classes of handlers. A Small Quantity Handler of Universal Waste (SQHUW) may store less than 5000 kg of UW at any time and a Large Quantity Handler of Universal Waste (LQHUW) may store 5000 kg or more of UW. The handler's management activities are limited to those specified in OAC rule 3745-273-13 for SQHUW and OAC rule 3745-273-33 for LQHUW. A Universal Waste Transporter must transport the waste in accordance with all U.S. DOT requirements.

For disposal purposes, hazardous paint-related waste must still be classified as hazardous or non-hazardous, based on the results of the Toxic Characteristic Leachate Procedure (TCLP) testing, to determine the destination facility (non-hazardous or hazardous disposal facility). The leachability test measures whether or not the metals leach from the waste in excess of the regulated level of 5.0 mg/L for lead, chromium and arsenic; or 1.0 mg/L for cadmium. If the results of the TCLP analysis exceed this level, the waste must be handled, transported and disposed as a hazardous waste in an approved waste site, reclamation facility or incinerator site.

EPA's regulations require the TCLP to be performed so that it represents the matrix and material of the waste stream. For the project, this can be in the form of a representative sample of debris taken either before or after the project begins. Since waste disposal is made up of a matrix of all debris that is to be disposed, combining painted surfaces with low XRF results with those surfaces with higher XRF results may classify the waste as non-hazardous for disposal purposes.

6.2.3 Scrap Metal Recycling

Metal components that will be removed which contain heavy metals are exempt from the requirements of RCRA if sent to a scrap facility for recycling and are, therefore, not considered waste. It is recommended that the owner receive a receipt or bill of lading from the scrap facility stating that the scrap metal was accepted and purchased by the scrap facility.

6.3 Additional Regulated Materials Survey

The PCB and mercury survey was performed on August 12, 2024 by Katie Bossert and Zachary Hamilton. The survey involved an inventory of suspect equipment and areas, and did not include sampling or analysis. The inspection was conducted on only the structures proposed for renovation/demolition as part of this project.

PCB Ballasts

Polychlorinated biphenyls (PCBs) were used in electrical oil-filled equipment such as transformers and light ballasts, until the EPA banned the manufacture and use of PCBs in 1978. According to the EPA, all ballasts manufactured prior to July 1978 have a greater than 50% chance of containing PCBs at 50 parts per million (ppm). Ballasts manufactured after July 1978 are required to bear a “No PCBs” label indicating that they do not contain PCBs.

Fluorescent light ballasts were observed within the project area. It should be assumed all ballasts are PCB-containing unless a “No PCBs” label is identified on the ballast during renovation activities. Under the Toxic Substance Control Act (TSCA), light ballasts containing PCBs should be sent to an EPA-approved chemical waste processing site and recycled. Light ballasts that do not contain PCBs are not regulated under TSCA. However, it should be assumed all ballasts are PCB containing unless a “No PCBs” label is identified on the ballast during renovation/demolition activities.

PCB Transformers

A “PCB transformer” is a transformer that is known, or assumed, to contain PCBs at concentrations greater than 500 parts per million (ppm) and are subject to EPA regulations. “PCB-contaminated transformers” contain between 50 to 499 ppm and are subject to different EPA regulations. Wet transformers used dielectric fluid that may contain PCBs if manufactured between 1929 and 1977.

No wet transformers were observed within the portion of the structures proposed for renovation/demolition. Pole-mounted transformers were observed throughout the property, and were labeled as “Non-PCB”. The electric utility company would be responsible for any cleanup necessitated by spills or leaks of dielectric fluid from these units.

PCB Hydraulic Oil

An old lubricant tank associated with the grease rack was present in the Generator Room (Room 14) and depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil. If hydraulic oil has greater than 50 ppm total concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500 ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste.

Mercury Survey

Fluorescent lamp tubes and metal halide lamps may contain up to 40 milligrams (mg) of elemental mercury, depending on the brand and manufacture date. Fluorescent lamp tubes are considered a regulated universal waste by the EPA. Mercury float switches may be present in the sump pumps within the structures. Float switches may contain up to 2.5 ounces of mercury, and there could be multiple switches in a sump pump. The following suspect mercury equipment were identified within the project area:

- Fluorescent lamp tubes;
- Metal halide lamps;
- Mercury thermostats;
- Mercury switches in sump pumps; and
- Equipment gages and switches.

If mercury-containing equipment is to be removed as part of this project, they should be removed from the structure in good condition, and not be broken or crushed. The equipment should then be properly recycled or disposed of at a facility which is EPA-approved for receiving mercury-containing material.

Miscellaneous Regulated Materials

Commercial truck batteries and battery-operated emergency exit signs were observed on the interior of the structures proposed for renovation/demolition. Sulfuric acid and lead are used in batteries and are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is prohibited in Ohio, and these batteries are required to be recycled at a licensed facility.

The Office Building/Garage building contained air-cooled condensing units with refrigerants. The refrigerants should be removed and recycled by an EPA-certified HVAC technician.

Electronic equipment was observed throughout the structures proposed for renovation/demolition, and is considered as electronic waste if there is no intent for re-use or at the end of “useful” life. Typical electronic waste consists of screens, monitors, large equipment and appliances, IT and telecommunication equipment. Electronic equipment is considered a regulated waste if not recycled, and must be evaluated to determine if it exhibits a characteristic of hazardous waste. Per OAC 3745.51.02, electronic waste is not regulated as a hazardous waste if properly recycled.

Numerous pesticides, paints, chemicals and petroleum products were observed stored throughout the facility. If these stored items are proposed for disposal as part of renovation/demolition, they should be profiled as hazardous waste, universal waste or as recyclable to determine the proper disposal and/or recycling methods.

7.0 RELIABILITY OF REPORT - DISCLAIMER

This report has been prepared to document findings of the hazardous material survey only, not for abatement design. Abatement design should be performed by appropriately experienced and credentialed personnel. Additional reconnaissance work, which may include minor demolition to access hidden areas and further sampling/analyses, should be expected as part of abatement design.

Our inspection excluded areas that require significant demolition of building surfaces and structures for access; therefore, should suspect asbestos-containing materials (e.g., pipe insulation, vermiculite, etc.) be discovered above fixed ceiling systems or within wall systems and inaccessible pipe chases, these materials should be properly sampled and removed by an abatement contractor if necessary

The opinions, conclusions, and recommendations presented in this report are put forth for a specific and proposed purpose and for the specific site discussed. Rii is not responsible for any other application, whether of purpose or location, of our opinions, conclusions, or recommendations, other than as specifically indicated in this report.

Conclusions reached in this report are based upon the objective data available to Rii at the time of forming the opinions as presented in this report. The accuracy of this report depends upon the accuracy of the data. The conclusions reached herein represent our opinions. Rii is not responsible for actual conditions proven to be materially at variance with the data that was available to them and upon which they relied, as presented in this report.

8.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

The state licenses of the personnel involved in this survey are provided in Appendix D. The environmental professionals responsible for the Hazardous Material Survey are as follows:

Zachary B. Hamilton, CPG, PG, LPG
Environmental Geologist
Certified Asbestos Hazard Evaluation Specialist – No. ES34150
Certified Asbestos Hazard Abatement Project Designer – No. PD60880

Katie Bossert
Environmental Specialist
Certified Asbestos Hazard Evaluation Specialist – No. ES549481

Kristy Engel-Shepard
Environmental Project Manager
Certified Asbestos Hazard Evaluation Specialist – No. ES34846
Certified Asbestos Hazard Abatement Project Designer – No. PD60776
Certified Lead Risk Assessor – No. LA9350

Michelle L. Eckels, CPG
Vice President – Environmental Services
Certified Asbestos Hazard Evaluation Specialist – No. ES33141
Certified Asbestos Hazard Abatement Project Designer – No. PD60600

DEFINITION OF TERMS

Abatement – Procedures to control fiber release from Asbestos-Containing Materials (ACM). Includes removal, encapsulation, and enclosure.

Asbestos – A generic name given to a number of naturally occurring hydrated mineral silicates that possess a unique crystalline structure, are incombustible in air, and separate into fibers. Asbestos includes the asbestiform varieties of chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite-grunerite); anthophyllite; tremolite, and actinolite, in any combination.

ACM - Asbestos-Containing Material – Any material containing more than 1% by weight of asbestos of any type or mixture of types (AHERA, OSHA definition).

Asbestos Fiber – A particle of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1 (OSHA definition).

Ballasts – Both magnetic and electronic ballasts used to regulate the current and power to a fluorescent and HID lamps. Magnetic ballasts may or may not include capacitors containing PCBs. Prior to 1978, ballasts were commonly manufactured with PCBs in the capacitor oil and in a tar-like substance that surrounds ballast components called “potting compound”. Ballasts with no PCBs, will have an identifying sticker “No PCB”.

Category I nonfriable ACM – Asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products containing more than 1 percent asbestos as determined using Polarized Light Microscopy, as specified in appendix E, subpart E, 40 CFR part 763, section 1.

Category II nonfriable ACM – Any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using Polarized Light Microscopy, as specified in appendix E, subpart E, 40 CFR part 763, section 1, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

EPA – Environmental Protection Agency.

Fluorescent Lamps – Low intensity discharge lamps that contain mercury and are commonly used in commercial and industrial lighting. Fluorescent lamps include tubes, circular and compact fluorescent lighting products, whether they use separate or integral ballast.

Friable Asbestos-Containing Material – Material that contains more than 1% asbestos by weight and that can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure (ODH definition).

Hazardous Substance - a substance defined as a hazardous substance pursuant to CERCLA 42 USC part 9601(14), as interpreted by EPA regulations and the courts: (A) any substance designated pursuant to section 1321(b)(2)(A) of Title 33, (B) any element, compound, mixture, solution, or substance designated pursuant to 42 USC part 9602, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 USC part 6921), (D) any toxic pollutant listed under section 1317(a) of Title 33, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act (42 USC part 7412), and (F) any imminently hazardous chemical substance or mixture with respect to which the EPA Administrator has taken action pursuant to section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under the items listed above. The term also does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and synthetic gas).

Hazardous Waste – Any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 USC 6921)(but not including any waste the regulation of which under the Solid Waste Disposal Act (42 USC 6901 et seq.) has been suspended by Act of Congress).

High Intensity Discharge or HID Lamps – Includes mercury, metal halide and high-pressure sodium lamps that contain mercury.

NESHAP – National Emission Standards for Hazardous Air Pollutants.

NIOSH – National Institute for Occupational Safety and Health.

NVLAP – National Voluntary Laboratory Accreditation Program

ODH – Ohio Department of Health

OSHA – Occupational Safety and Health Administration.

PCM – Phase Contrast Microscopy – An optical microscopic technique used for the counting of fibers in air samples, but which does not distinguish fiber types.

PLM – Polarized Light Microscopy – Bulk sample analysis of suspect asbestos sample using microscope equipped with dual polarizing filters to observe optical properties of the sample.

PPE – Personal Protective Equipment – Equipment worn to minimize exposure to a variety of hazards. Example of PPE includes such items as gloves, foot and eye protection, protective hearing devices, hard hats, respirators and full body suits.

RCRA – Resource Conservation and Recovery Act.

Regulated ACM (RACM) –

a) Friable asbestos material;
b) Category I nonfriable ACM that has become friable;
c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or
d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by 40 CFR Part 61.

TCLP – Toxic Characteristic Leachate Procedure.

XRF – X-ray Fluorescence

TABLES

TABLE 2 – ASBESTOS SAMPLE RESULTS SUMMARY

Sample ID	Location	Sample Material	HA Code	% Asbestos*
MOBILE TRAILER				
001	Inside closet wall	Fiberglass wall insulation – light yellow	MT1	NAD
002	Inside closet wall	Fiberglass wall insulation – light yellow	MT1	NAD
003	Ceiling	Drywall Textured finish	MT2 MT3	NAD NAD
004	Ceiling	Drywall Textured finish	MT2 MT3	NAD NAD
005	Wall	Fiberglass wall insulation - yellow	MT4	NAD
006	Wall	Fiberglass wall insulation - yellow	MT4	NAD
007	Duct work	Fiberglass duct insulation - yellow	MT5	NAD
008	Duct work	Fiberglass duct insulation - yellow	MT5	NAD
009	Trailer floor	12”x12” Floor tile – tan & gray Clear mastic	MT6 MT7	NAD NAD
010	Trailer floor	12”x12” Floor tile – tan & gray Clear mastic	MT6 MT7	NAD NAD
011	NW window	Window caulk - white	MT8	NAD
012	NE window	Window caulk - white	MT8	NAD
013	West wall – electric box	Gray caulk	MT9	NAD
014	West wall – electric box	Gray caulk	MT9	NAD
015	Trailer roof	Silver roof sealant	MT10	NAD
016	Trailer roof	Silver roof sealant	MT10	NAD
017	Trailer roof	Silicone caulk - black	MT11	NAD
018	Trailer roof	Silicone caulk - black	MT11	NAD
SMALL PUMP STRUCTURE				
019	Interior wall space	Yellow foam insulation	SP1	NAD
020	Interior wall space	Yellow foam insulation	SP1	NAD
SALT DOME BUILDING				
021	Roof	Asphalt shingle Tar paper	SD1 SD2	NAD NAD
022	Roof	Asphalt shingle Tar paper	SD1 SD2	NAD NAD
OFFICE BUILDING/GARAGE				
023	Upper Roof – center	White membrane Roof tar Blue Styrofoam Brown fiber board	OB1 OB2 OB3 OB4	NAD NAD NAD NAD
024	Lower Roof – NW corner	White membrane Roof tar Blue Styrofoam Brown fiber board	OB1 OB2 OB3 OB4	NAD NAD NAD NAD
025	**Upper Roof – parapet metal cap**	**Brown caulk**	**OB5**	**5% Chrysotile**
026	**Upper Roof – parapet metal cap**	**Brown caulk**	**OB5**	**8% Chrysotile**

*NAD - No Asbestos Detected

**Point Count Result

TABLE 2 – ASBESTOS SAMPLE RESULTS SUMMARY

Sample ID	Location	Sample Material	HA Code	% Asbestos*
027	Upper Roof	Pipe caulk – white & tan	OB6	NAD
028	Upper Roof	Pipe caulk – white & tan	OB6	NAD
029	Upper Roof	Pipe caulk – red	OB7	NAD
030	Upper Roof	Pipe caulk – red	OB7	NAD
031	Lower Roof – dripline	Tan & white caulk	OB8	NAD
032	Lower Roof - dripline	Tan & white caulk	OB8	NAD
033	**Room 9**	**12”x12” Floor tile – tan w/ brown** Black mastic	**OB9** OB10	**4% Chrysotile** NAD
034	**Room 10**	**12”x12” Floor tile – tan w/ brown** Black mastic	**OB9** OB10	**4% Chrysotile** NAD
035	Room 8	Cove base – brown Yellow mastic	OB11 OB12	NAD NAD
036	Room 8	Cove base – brown Yellow mastic	OB11 OB12	NAD NAD
037	Room 9	2’x4’ Ceiling tile - textured	OB13	NAD
038	Room 9	2’x4’ Ceiling tile - textured	OB13	NAD
039	Room 8	2’x4’ Ceiling tile – random perforations	OB14	NAD
040	Room 8 hall	2’x4’ Ceiling tile – random perforations	OB14	NAD
041	Room 8	12”x12” Floor tile – tan with gray Brown mastic	OB15 OB16	NAD NAD
042	Room 9	12”x12” Floor tile – tan with gray Brown mastic	OB15 OB16	NAD NAD
043	Room 6 – Overhead garage door frame	Black caulk	OB17	NAD
044	Room 6 – Overhead garage door frame	Black caulk	OB17	NAD
045	Room 7	Blue pipe sealant	OB18	NAD
046	Room 7	Blue pipe sealant	OB18	NAD
047	Room 9 - wall	Brown fiber board White vinyl	OB19 OB20	NAD NAD
048	Room 9 - wall	Brown fiber board White vinyl	OB19 OB20	NAD NAD
049	Room 7 – Overhead garage door frame	Gray caulk	OB21	NAD
050	Room 7 – Overhead garage door frame	Gray caulk	OB21	NAD
051	Room 7 floor coating	Gray epoxy	OB22	NAD
052	Room 7 floor coating	Gray epoxy	OB22	NAD
053	**Room 5**	**Tan door caulk**	**OB23**	**0.75% Chrysotile****
054	**Room 5**	**Tan door caulk**	**OB23**	**1.50% Chrysotile****
055	Room 7	Gray floor caulk	OB24	NAD
056	Room 7	Gray floor caulk	OB24	NAD
057	Room 8	Cove base – dark brown Tan mastic	OB25 OB26	NAD NAD
058	Room 9	Cove base – dark brown Tan mastic	OB25 OB26	NAD NAD

*NAD - No Asbestos Detected
**Point Count Result

TABLE 2 – ASBESTOS SAMPLE RESULTS SUMMARY

Sample ID	Location	Sample Material	HA Code	% Asbestos*
059	Room 7	Fiberglass pipe insulation – yellow Pipe end sealant Cloth wrap	OB27 OB28 OB29	NAD NAD NAD
060	Room 7	Fiberglass pipe insulation – yellow Pipe end sealant Cloth wrap	OB27 OB28 OB29	NAD NAD NAD
061	Room 7	Fiberglass pipe insulation – yellow Pipe end sealant Cloth wrap	OB27 OB28 OB29	NAD NAD NAD
062	Room 1	2'x4' Ceiling tile – pinholes	OB30	NAD
063	Room 10	2'x4' Ceiling tile – pinholes	OB30	NAD
064	**Room 7 – Interior door frame**	**Gray caulk - flexible**	**OB31**	**0.75% Chrysotile****
065	**Room 7 – Interior door frame**	**Gray caulk - flexible**	**OB31**	**1.25% Chrysotile****
066	**Room 7 – Interior door frame**	**Gray caulk - hard**	**OB32**	**1.75% Chrysotile****
067	**Room 7 – Interior door frame**	**Gray caulk - hard**	**OB32**	**1.25% Chrysotile****
068	**Room 3 – Interior**	**Gray window glazing**	**OB33**	**0.25% Chrysotile****
069	**Room 3 – Interior**	**Gray window glazing**	**OB33**	**0.75% Chrysotile****
070	**Room 3 - Exterior**	**Gray window glazing**	**OB34**	**1.50% Chrysotile****
071	**Room 3 - Exterior**	**Gray window glazing**	**OB34**	**1.25% Chrysotile****
072	Room 7 - Door	Gray window glazing (door)	OB35	NAD
073	Room 7 - Door	Gray window glazing (door)	OB35	NAD
074	Room 9	Joint compound – white Drywall	OB36 OB37	NAD NAD
075	Room 9	Joint compound – white Drywall	OB36 OB37	NAD NAD
076	Room 7 – Exterior security glass	Window mortar	OB38	NAD
077	Room 7 – Exterior security glass	Window mortar	OB38	NAD
078	Room 6	Duct mastic - brown	OB39	NAD
079	Room 6	Duct mastic - brown	OB39	NAD
080	**Room 4 floor coating**	**Gray epoxy – with white flecks**	**OB40**	**0.50% Chrysotile****
081	**Room 4 floor coating**	**Gray epoxy – with white flecks**	**OB40**	**0.25% Chrysotile****
082	Room 11	Fiberglass pipe insulation – yellow Pipe end sealant	OB27 OB28	NAD NAD
083	Room 11	Fiberglass pipe insulation – yellow Pipe end sealant	OB27 OB28	NAD NAD
084	Room 4 – Exterior window	White caulk	OB41	NAD
085	Room 4 – Exterior window	White caulk	OB41	NAD
086	Room 6 – Exterior door	White caulk	OB42	NAD
087	Room 6 – Exterior door	White caulk	OB42	NAD
088	Front Entrance	Red door caulk	OB43	NAD
089	Front Entrance	Red door caulk	OB43	NAD
090	Exterior wall - west	Black expansion joint	OB44	NAD

*NAD - No Asbestos Detected

**Point Count Result

TABLE 2 – ASBESTOS SAMPLE RESULTS SUMMARY

Sample ID	Location	Sample Material	HA Code	% Asbestos*
091	Exterior wall - south	Black expansion joint	OB44	NAD
092	Room 4 – Exterior door	Gray caulk	OB45	NAD
093	Room 7 – South door	Gray caulk	OB45	NAD
094	**Room 4 – Exterior window**	**Brown caulk**	**OB46**	**2.25% Chrysotile****
095	Room 4 – Exterior window	Brown caulk	OB46	NAD
096	**Front Entrance – Door frame**	**Black caulk**	**OB47**	**2.50% Chrysotile****
097	**Front Entrance – Door frame**	**Black caulk**	**OB47**	**1.25% Chrysotile****
098	**Exterior wall – below security glass**	**White caulk**	**OB48**	**0.50% Chrysotile****
099	**Exterior wall – below security glass**	**White caulk**	**OB48**	**0.75% Chrysotile****
100	Room 7 – East overhead garage door	Black expansion joint	OB49	NAD
101	Room 7 – East overhead garage door	Black expansion joint	OB49	NAD
102	Room 14	Pipe end sealant Cloth wrap Gray pipe cement Fiberglass pipe insulation - yellow	OB50 OB51 OB52 OB53	NAD NAD NAD NAD
103	Room 14	Pipe end sealant Cloth wrap Gray pipe cement Fiberglass pipe insulation - yellow	OB50 OB51 OB52 OB53	NAD NAD NAD NAD
104	Room 14 – pipe fitting	Cloth wrap Gray pipe cement Fiberglass pipe insulation - yellow	OB51 OB52 OB53	NAD NAD NAD
105	Room 14 – pipe fitting	Cloth wrap Gray pipe cement Fiberglass pipe insulation - yellow	OB51 OB52 OB53	NAD NAD NAD

*NAD - No Asbestos Detected
**Point Count Result

APPENDIX A

FIGURES

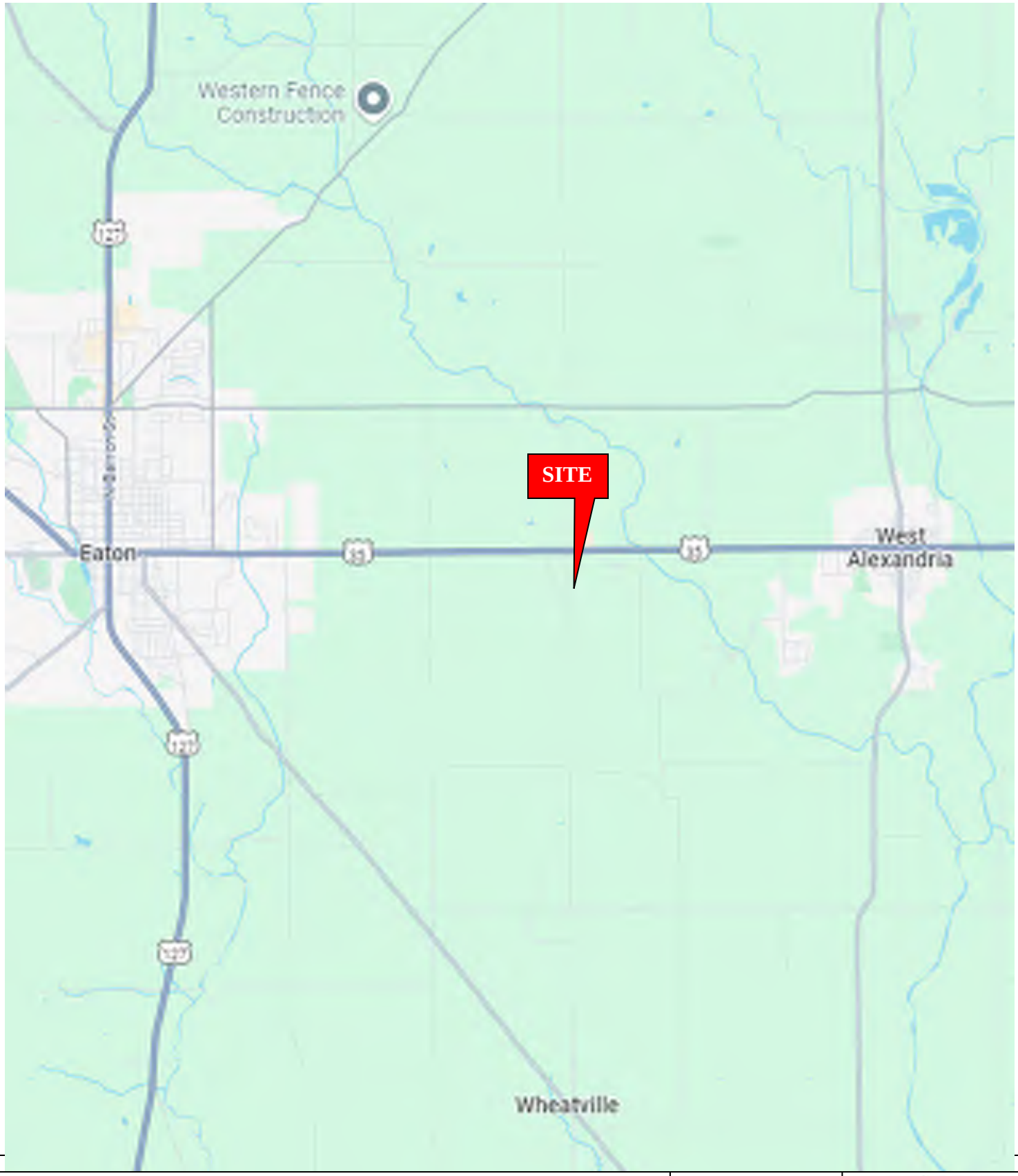


FIGURE 1 - REGIONAL LOCATION MAP

ODOT Preble County Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

N

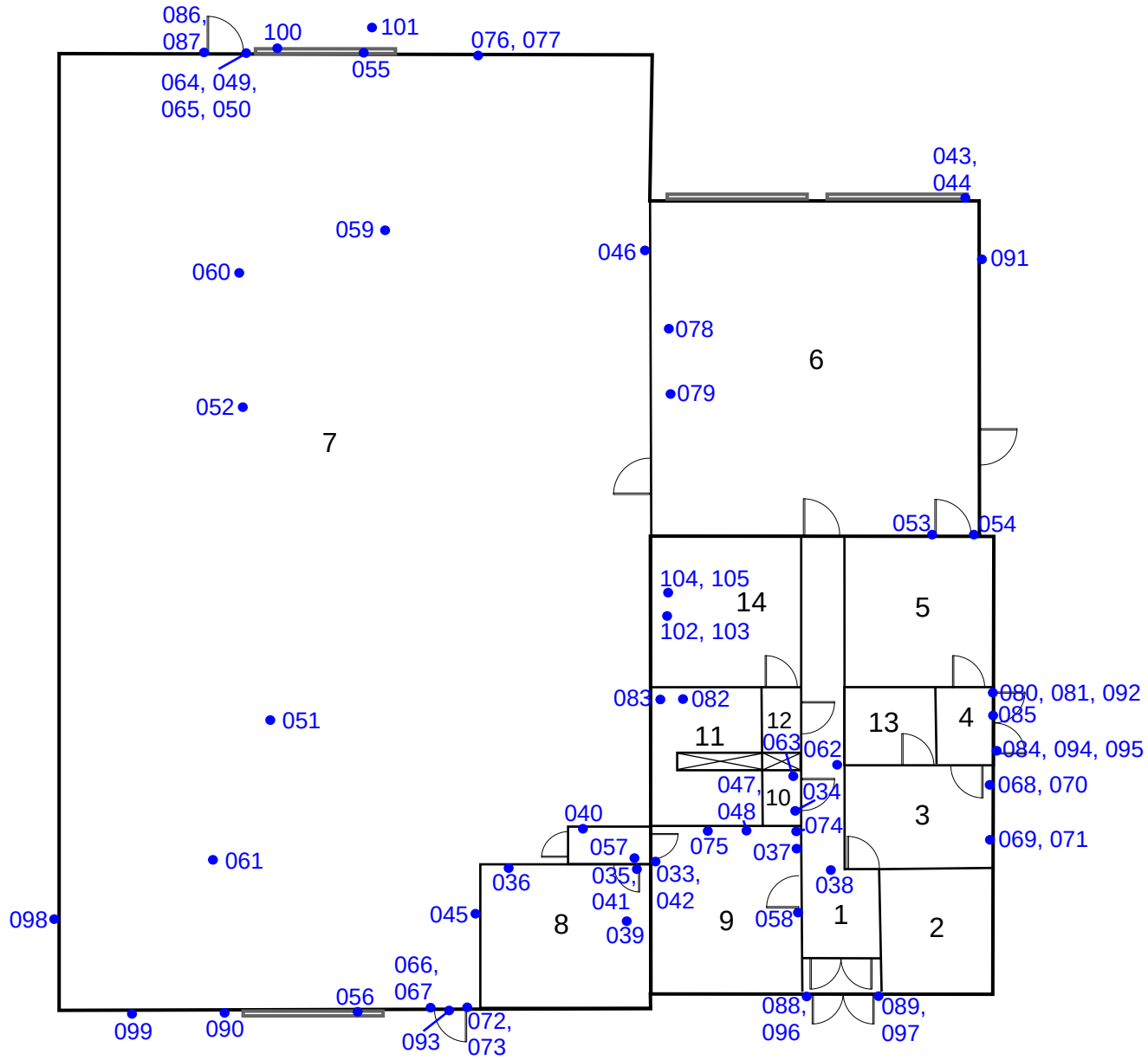
Rii Project
B-24-018

ODOT Preble County Maintenance Facility
234 Quaker Trace Road
West Alexandria, OH 45381

FIGURE 2
AERIAL LOCATION MAP

Rii Project
B-24-018

September 2024



Resource International	N	**FIGURE 3 - ASBESTOS SAMPLING LOCATIONS** OFFICE BUILDING/GARAGE	B-24-018 September 2024

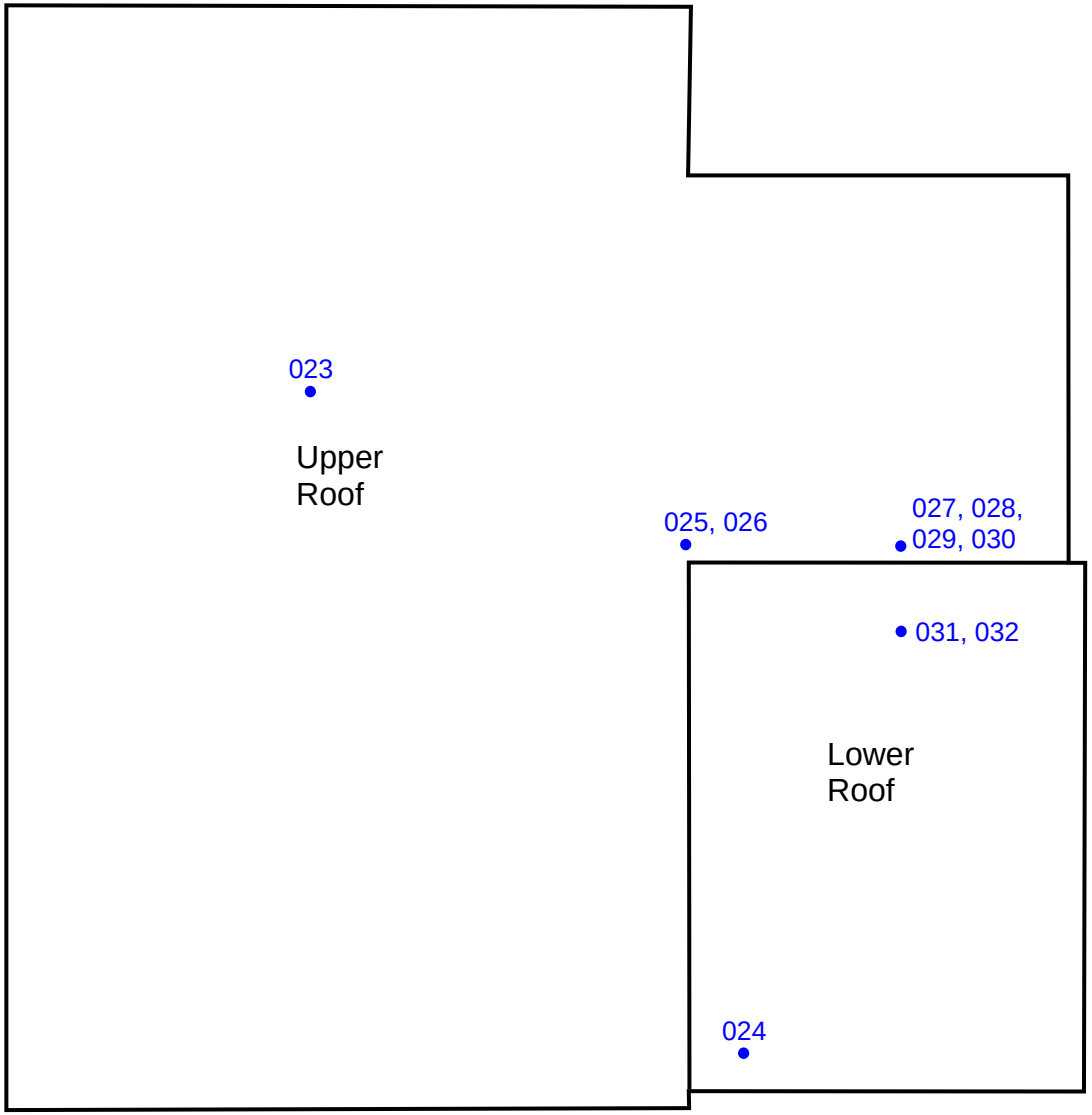
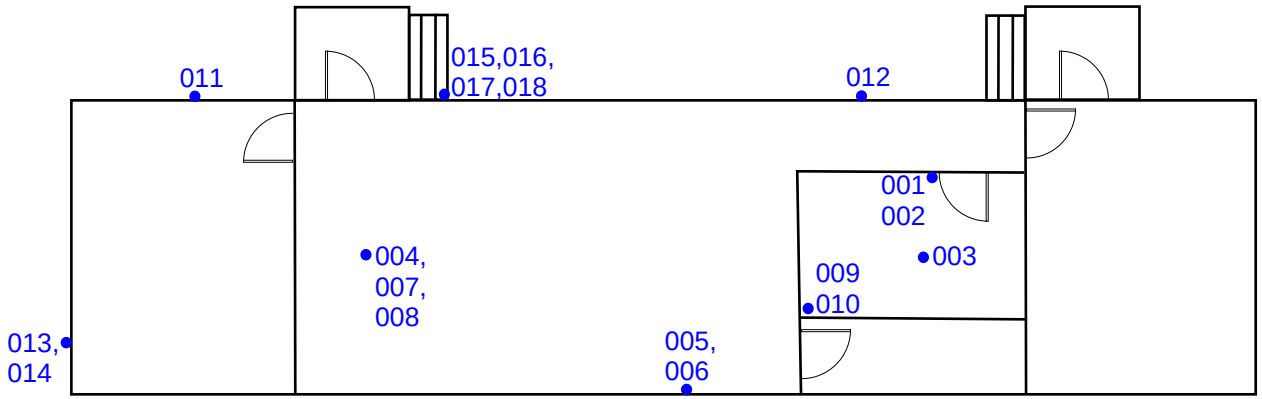


FIGURE 4 - ASBESTOS SAMPLING LOCATIONS
OFFICE BUILDING/GARAGE - ROOF

B-24-018

September 2024

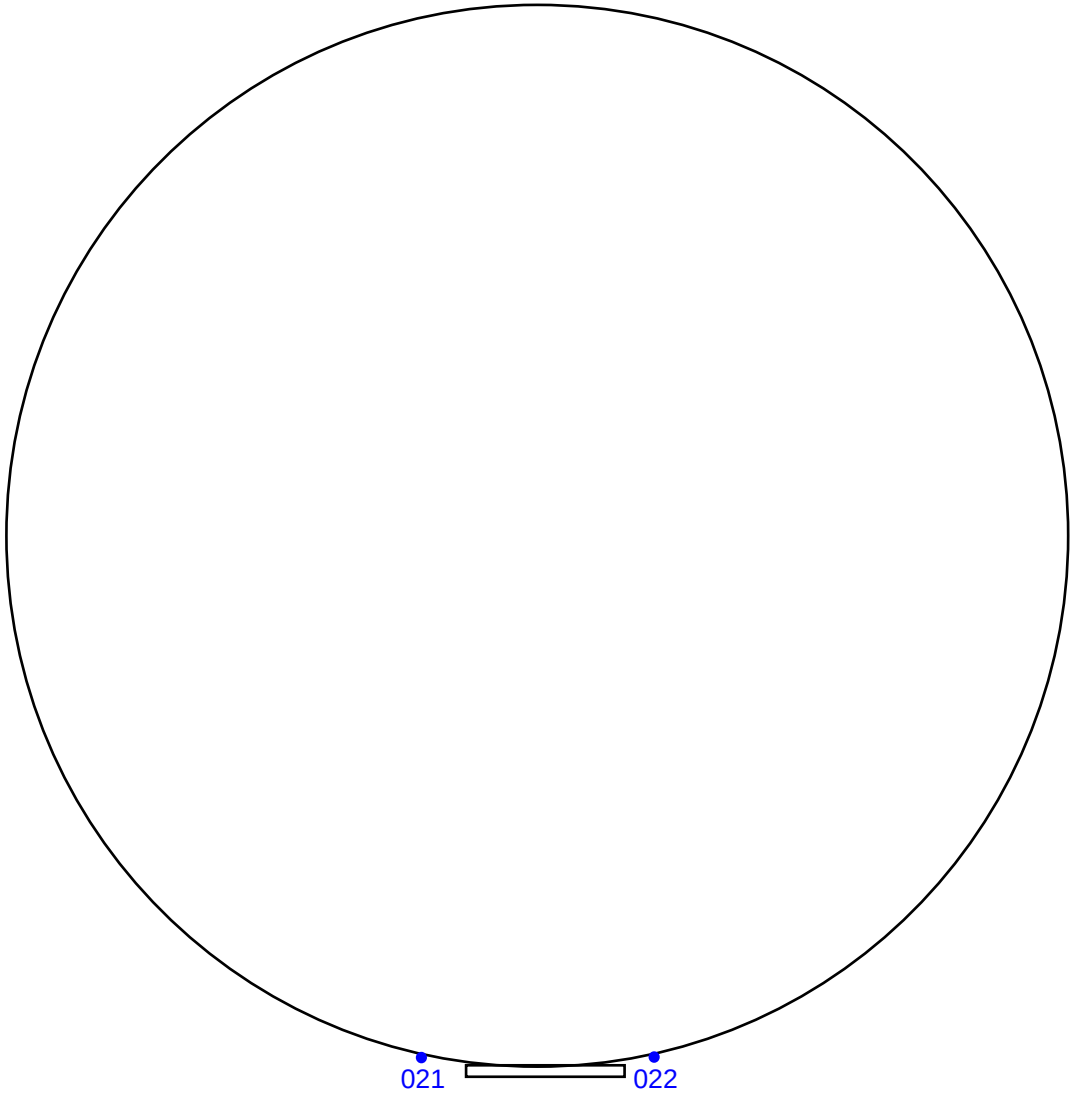


N

FIGURE 5 - ASBESTOS SAMPLING LOCATIONS
MOBILE TRAILER

B-24-018

September 2024



N

FIGURE 6 - ASBESTOS SAMPLING LOCATIONS
SALT DOME

B-24-018

September 2024

APPENDIX B

SITE PHOTOGRAPHS

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
1	8/12/2024

Description:

Office Building/Garage: The 12”x12” Floor tile – tan with brown was asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
2	8/12/2024

Description:

Office Building/Garage: The tan door caulk was asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
3	8/12/2024

Description:

Office Building/Garage: The black caulk on door frames was asbestos-containing. The white caulk was non-asbestos containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
4	8/12/2024

Description:

Office Building/Garage: The gray window glazing and brown window caulk were asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
5	8/12/2024

Description:

Office Building/Garage: The brown caulk on roof parapets and fascia were asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
6	8/12/2024

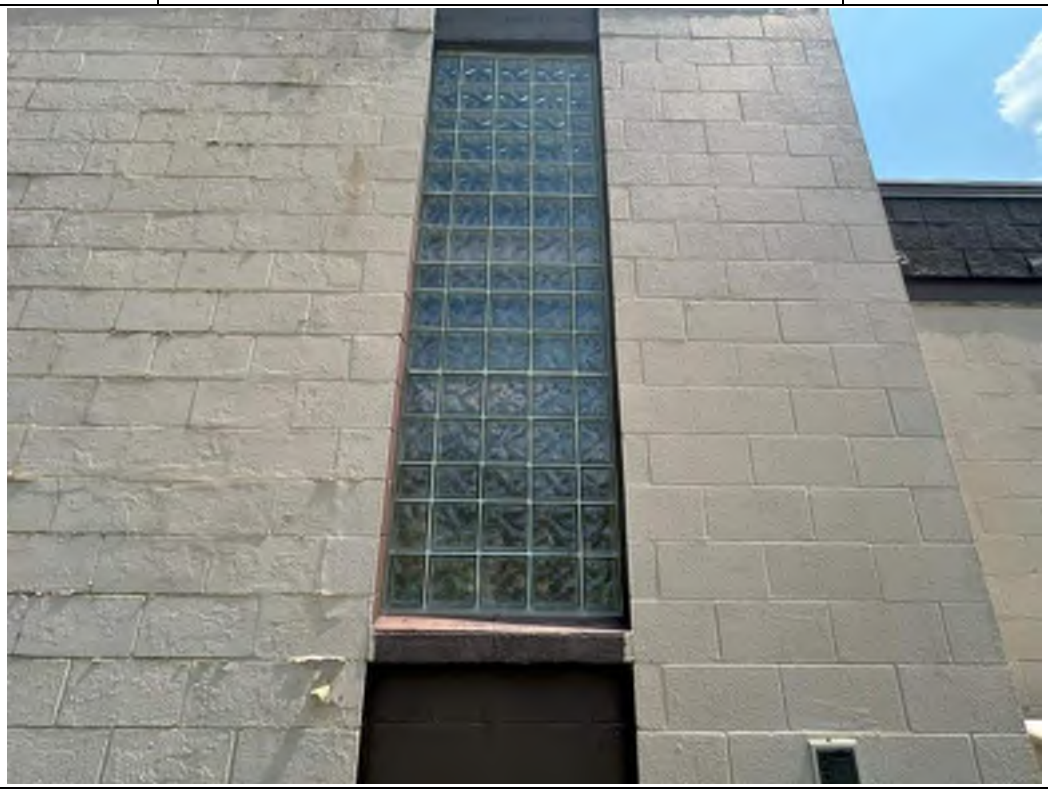
Description:

Office Building/Garage: The gray epoxy floor coating with white flecks was <1% asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
7	8/12/2024



Description:

Office Building/Garage: The white caulk on security glass windows was <1% asbestos-containing.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
8	8/12/2024

Description:

Office Building/Garage: The boiler insulation and Van Packer© breeching were assumed to be asbestos-containing until further evaluated during construction.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
9	8/12/2024

Description:

Office Building/Garage:
Fire doors were assumed to be asbestos-containing until further evaluated during construction.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
10	8/12/2024

Description:

Pole Barn:
The aluminum siding contained chromium coatings.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
11	8/12/2024

Description:

Sand/Salt Building:
The I-beams contained lead and chromium coatings.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
12	8/12/2024

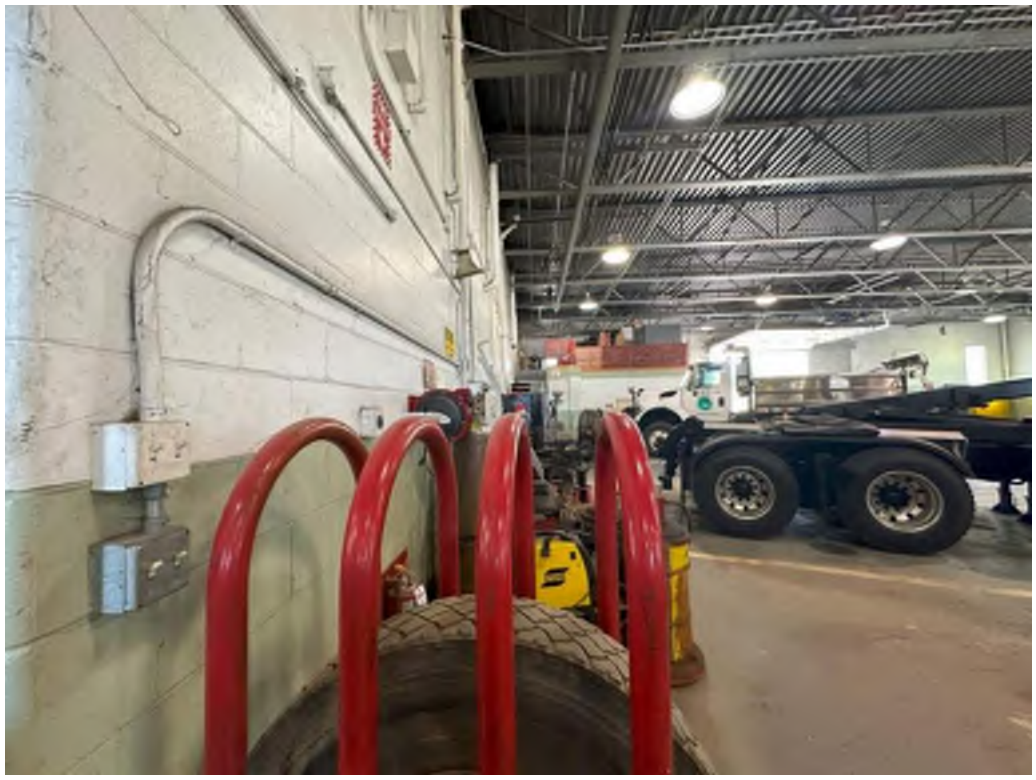
Description:

Mobile Trailer:
The exterior trim, siding, windows, doors and trailer skirt contained chromium coatings.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No. 13 | **Date:** 8/12/2024



Description:

Office Building/Garage: The tire rack and I-beams contained lead and chromium coatings.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No. 14 | **Date:** 8/12/2024

Description:

Office Building/Garage: An old lubricant tank, associated with the former grease rack, was present in the Generator Room and depending on the age of the equipment, it may contain PCB-containing lubricant hydraulic oil.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
15	8/12/2024

Description:

Office Building/Garage: Suspect mercury-containing thermostats were observed.

PHOTOGRAPHIC LOG

Project Name:	Location:	Project No.
Hazardous Materials Survey	234 Quaker-Trace Road, West Alexandria, Ohio	B-24-018

Photo No.	Date:
16	8/12/2024

Description:

Office Building/Garage: Metal halide and fluorescent light ballasts were observed and may contain PCBs.

APPENDIX C

ANALYTICAL RESULTS & CHAIN-OF-CUSTODIES

EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order ID:	042417642
Customer ID:	RESI25
Customer PO:	B24-018
Project ID:	

Attn: Michelle Eckels
Resource International
6350 Presidential Gateway
Columbus, OH 43231

Phone:	(614) 390-5988
Fax:	(614) 823-4990
Collected:	
Received:	8/22/2024
Analyzed:	9/09/2024

Proj: B-24-018 / Preble Maintenance Facility

Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 001 ***Lab Sample ID:*** **042417642-0001**

Sample Description: Trailer - Inside Closet Wall/Light Yellow Fiberglass Wall Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Yellow	90.0%	10.0%	None Detected	

Client Sample ID: 002 ***Lab Sample ID:*** **042417642-0002**

Sample Description: Trailer - Inside Closet Wall/Light Yellow Fiberglass Wall Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 003-Drywall ***Lab Sample ID:*** **042417642-0003**

Sample Description: Trailer/Drywal Ceiling w/Textured Finish

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Brown/White	12.0%	88.0%	None Detected	

Client Sample ID: 003-Texture ***Lab Sample ID:*** **042417642-0003A**

Sample Description: Trailer/Drywal Ceiling w/Textured Finish

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	White	5.0%	95.0%	None Detected	

Client Sample ID: 004-Drywall ***Lab Sample ID:*** **042417642-0004**

Sample Description: Trailer/Drywal Ceiling w/Textured Finish

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	18.0%	82.0%	None Detected	

Client Sample ID: 004-Texture ***Lab Sample ID:*** **042417642-0004A**

Sample Description: Trailer/Drywal Ceiling w/Textured Finish

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	3.0%	97.0%	None Detected	

Client Sample ID: 005 ***Lab Sample ID:*** **042417642-0005**

Sample Description: Trailer - Wall to Exterior/Yellow Fiberglass Wall Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Yellow	90.0%	10.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 006 ***Lab Sample ID:*** **042417642-0006**

Sample Description: Trailer - Wall to Exterior/Yellow Fiberglass Wall Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 007 ***Lab Sample ID:*** **042417642-0007**

Sample Description: Trailer/Yellow Fiberglass Duct Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Yellow	90.0%	10.0%	None Detected	

Client Sample ID: 008 ***Lab Sample ID:*** **042417642-0008**

Sample Description: Trailer/Yellow Fiberglass Duct Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 009-Floor Tile ***Lab Sample ID:*** **042417642-0009**

Sample Description: Trailer/12x12 Gray & Tan Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 009-Mastic ***Lab Sample ID:*** **042417642-0009A**

Sample Description: Trailer/Clear Mastic assoc. with 12x12 Gray & Tan Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Clear	0.0%	100.0%	None Detected	

Client Sample ID: 010-Floor Tile ***Lab Sample ID:*** **042417642-0010**

Sample Description: Trailer/12x12 Gray & Tan Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray/Tan	0.0%	100.0%	None Detected	

Client Sample ID: 010-Mastic ***Lab Sample ID:*** **042417642-0010A**

Sample Description: Trailer/Clear Mastic assoc. with 12x12 Gray & Tan Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 011 ***Lab Sample ID:*** **042417642-0011**

Sample Description: NW Window of Trailer/White Window Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 012 ***Lab Sample ID:*** **042417642-0012**

Sample Description: NE Window of Trailer/White Window Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 013 ***Lab Sample ID:*** **042417642-0013**

Sample Description: West Wall of Trailer - Under Electric Box/Gray Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 014 ***Lab Sample ID:*** **042417642-0014**

Sample Description: West Wall of Trailer - Under Electric Box/Gray Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	6.0%	94.0%	None Detected	

Client Sample ID: 015 ***Lab Sample ID:*** **042417642-0015**

Sample Description: Edge of Roof - Trailer/Silver Roof Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Silver	0.0%	100.0%	None Detected	

Client Sample ID: 016 ***Lab Sample ID:*** **042417642-0016**

Sample Description: Edge of Roof - Trailer/Silver Roof Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Silver	0.0%	100.0%	None Detected	

Client Sample ID: 017 ***Lab Sample ID:*** **042417642-0017**

Sample Description: Edge of Roof - Trailer/Black Silicon Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black/Silver	10.0%	90.0%	None Detected	Inseparable paint / coating layer included in analysis

Client Sample ID: 018 ***Lab Sample ID:*** **042417642-0018**

Sample Description: Edge of Roof - Trailer/Black Silicon Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Black/Silver	6.0%	94.0%	None Detected	

Client Sample ID: 019 ***Lab Sample ID:*** **042417642-0019**

Sample Description: Small Pump Structure - Walls/Yellow Foam Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 020 ***Lab Sample ID:*** **042417642-0020**

Sample Description: Small Pump Structure - Walls/Yellow Foam Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 021-Shingle ***Lab Sample ID:*** **042417642-0021**

Sample Description: Salt Dome Roof/Shingle Paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black	15.0%	85.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 021-Tar **Lab Sample ID:** **042417642-0021A**
Sample Description: Salt Dome Roof/Tar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 022-Shingle **Lab Sample ID:** **042417642-0022**
Sample Description: Salt Dome Roof/Shingle Paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Red/Black	30.0%	70.0%	None Detected	

Client Sample ID: 022-Tar Paper **Lab Sample ID:** **042417642-0022A**
Sample Description: Salt Dome Roof/Tar Paper

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Black	40.0%	60.0%	None Detected	

Client Sample ID: 023-Membrane **Lab Sample ID:** **042417642-0023**
Sample Description: Upper Roof Center/White Membrane

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	White	80.0%	20.0%	None Detected	

Client Sample ID: 023-Tar **Lab Sample ID:** **042417642-0023A**
Sample Description: Upper Roof Center/Tar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black	5.0%	95.0%	None Detected	

Client Sample ID: 023-Styrofoam **Lab Sample ID:** **042417642-0023B**
Sample Description: Upper Roof Center/Blue Styrofoam

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Blue	0.0%	100.0%	None Detected	

Client Sample ID: 023-Stone **Lab Sample ID:** **042417642-0023C**
Sample Description: Upper Roof Center/Stone w/Tar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024				Layer Not Present	

Client Sample ID: 023-Fiberboard **Lab Sample ID:** **042417642-0023D**
Sample Description: Upper Roof Center/Brown Fiberboard

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Brown	80.0%	20.0%	None Detected	

Client Sample ID: 023-Metal Decking **Lab Sample ID:** **042417642-0023E**
Sample Description: Upper Roof Center/Metal Decking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024				Layer Not Present	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 024-Membrane ***Lab Sample ID:*** **042417642-0024**

Sample Description: South Lower Roof - NW Corner/White Membrane

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	50.0%	50.0%	None Detected	

Client Sample ID: 024-Tar ***Lab Sample ID:*** **042417642-0024A**

Sample Description: South Lower Roof - NW Corner/Blue Styrofoam

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 024-Styrofoam ***Lab Sample ID:*** **042417642-0024B**

Sample Description: South Lower Roof - NW Corner/Stone w/Tar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Green	0.0%	100.0%	None Detected	

Client Sample ID: 024-Stone ***Lab Sample ID:*** **042417642-0024C**

Sample Description: South Lower Roof - NW Corner/Brown Fiberboard

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 024-Fiberboard ***Lab Sample ID:*** **042417642-0024D**

Sample Description: South Lower Roof - NW Corner/Metal Decking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 024-Metal Decking ***Lab Sample ID:*** **042417642-0024E**

Sample Description: South Lower Roof - NW Corner/Metal Decking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024				Layer Not Present	

Client Sample ID: 025 ***Lab Sample ID:*** **042417642-0025**

Sample Description: Soffit - Upper Roof/Brown Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Brown	15.0%	80.0%	**5% Chrysotile**	

Client Sample ID: 026 ***Lab Sample ID:*** **042417642-0026**

Sample Description: Soffit - Upper Roof/Brown Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Brown/Tan	10.0%	82.0%	**8% Chrysotile**	

Client Sample ID: 027 ***Lab Sample ID:*** **042417642-0027**

Sample Description: Roof of Main Building/White & Tan Pipe Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Tan/White	20.0%	80.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 028 ***Lab Sample ID:*** **042417642-0028**

Sample Description: Roof of Main Building/White & Tan Pipe Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan/White	0.0%	100.0%	None Detected	

Client Sample ID: 029 ***Lab Sample ID:*** **042417642-0029**

Sample Description: Roof of Main Building/Red Pipe Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Red	0.0%	100.0%	None Detected	

Client Sample ID: 030 ***Lab Sample ID:*** **042417642-0030**

Sample Description: Roof of Main Building/Red Pipe Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Red	0.0%	100.0%	None Detected	

Client Sample ID: 031 ***Lab Sample ID:*** **042417642-0031**

Sample Description: Drip Line of Lower Roof/Tan & White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Tan/White	20.0%	80.0%	None Detected	

Client Sample ID: 032 ***Lab Sample ID:*** **042417642-0032**

Sample Description: Drip Line of Upper Roof/Tan & White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	10.0%	90.0%	None Detected	

Client Sample ID: 033-Floor Tile ***Lab Sample ID:*** **042417642-0033**

Sample Description: Room 9/12x12 Tan w/Brown Mottle Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Tan	0.0%	96.0%	**4% Chrysotile**	

Client Sample ID: 033-Mastic ***Lab Sample ID:*** **042417642-0033A**

Sample Description: Room 9/Black Mastic assoc w/12x12 Tan w/Brown Mottle Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 034-Floor Tile ***Lab Sample ID:*** **042417642-0034**

Sample Description: Room 10/12x12 Tan w/Brown Mottle Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	0.0%	96.0%	**4% Chrysotile**	

Client Sample ID: 034-Mastic ***Lab Sample ID:*** **042417642-0034A**

Sample Description: Room 10/Black Mastic assoc w/12x12 Tan w/Brown Mottle Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Black	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 035-Cove Base ***Lab Sample ID:*** **042417642-0035**

Sample Description: Room 8/Brown Vinyl Cove Base

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 035-Mastic ***Lab Sample ID:*** **042417642-0035A**

Sample Description: Room 8/Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Yellow	0.0%	100.0%	None Detected	

Client Sample ID: 036-Cove Base ***Lab Sample ID:*** **042417642-0036**

Sample Description: Room 8/Brown Vinyl Cove Base

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 036-Mastic ***Lab Sample ID:*** **042417642-0036A**

Sample Description: Room 8/Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 037 ***Lab Sample ID:*** **042417642-0037**

Sample Description: Room 9/2x4 Ceiling Tile - Textured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Gray/White	80.0%	20.0%	None Detected	

Client Sample ID: 038 ***Lab Sample ID:*** **042417642-0038**

Sample Description: Room 9/2x4 Ceiling Tile - Textured

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	80.0%	20.0%	None Detected	

Client Sample ID: 039 ***Lab Sample ID:*** **042417642-0039**

Sample Description: Room 8/2x4 Ceiling Tile - Random Perforations

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Gray/White	80.0%	20.0%	None Detected	

Client Sample ID: 040 ***Lab Sample ID:*** **042417642-0040**

Sample Description: Room 8 - Outside Hall/2x4 Ceiling Tile - Random Perforations

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	80.0%	20.0%	None Detected	

Client Sample ID: 041 ***Lab Sample ID:*** **042417642-0041**

Sample Description: Room 8/12x12 Tan w/Gray Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Tan	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 042-Floor Tile ***Lab Sample ID:*** **042417642-0042**

Sample Description: Room 9/12x12 Tan w/Gray Floor Tile

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 042-Mastic ***Lab Sample ID:*** **042417642-0042A**

Sample Description: Room 9/Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Brown/Black	3.0%	97.0%	None Detected	Result includes a small amount of inseparable attached material

Client Sample ID: 043 ***Lab Sample ID:*** **042417642-0043**

Sample Description: Room 6 - Exterior Door Frame/Black Garage Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 044 ***Lab Sample ID:*** **042417642-0044**

Sample Description: Room 6 - Exterior Door Frame/Black Garage Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 045 ***Lab Sample ID:*** **042417642-0045**

Sample Description: Room 7 - W/Blue Pipe Salant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Blue	0.0%	100.0%	None Detected	

Client Sample ID: 046 ***Lab Sample ID:*** **042417642-0046**

Sample Description: Room - F/Blue Pipe Salant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Blue	10.0%	90.0%	None Detected	

Client Sample ID: 047-Fiberbroad ***Lab Sample ID:*** **042417642-0047**

Sample Description: Room 9/Brown Fiber Board

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Brown	90.0%	10.0%	None Detected	

Client Sample ID: 047-Vinyl ***Lab Sample ID:*** **042417642-0047A**

Sample Description: Room 9/White Vinyl

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 048-Fiberbroad ***Lab Sample ID:*** **042417642-0048**

Sample Description: Room 9/Brown Fiber Board

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Brown	90.0%	10.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 048-Vinyl **Lab Sample ID:** **042417642-0048A**
Sample Description: Room 9/White Vinyl

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 049 **Lab Sample ID:** **042417642-0049**
Sample Description: Room 7/Gray Caulk - Garge Door Frame

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/29/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 050 **Lab Sample ID:** **042417642-0050**
Sample Description: Room 7/Gray Caulk - Garge Door Frame

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	10.0%	90.0%	None Detected	

Client Sample ID: 051 **Lab Sample ID:** **042417642-0051**
Sample Description: Room 7/Gray Epoxy

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 052 **Lab Sample ID:** **042417642-0052**
Sample Description: Room 7/Gray Epoxy

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 053 **Lab Sample ID:** **042417642-0053**
Sample Description: Room 5/Tan Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	0.0%	96.0%	**4% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Tan	0.00%	99.25%	**0.75% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 054 **Lab Sample ID:** **042417642-0054**
Sample Description: Room 5/Tan Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Tan	0.0%	96.0%	**4% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Tan	0.0%	98.5%	**1.50% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 055 **Lab Sample ID:** **042417642-0055**
Sample Description: Room 7 - Garage Door Meets Ground/Gray Floor Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 056 ***Lab Sample ID:*** **042417642-0056**

Sample Description: Room 7 - Garage Door Meets Ground/Gray Floor Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 057-Cove Base ***Lab Sample ID:*** **042417642-0057**

Sample Description: Room 8/Dark Brown Vinyl Cove Base

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 057-Mastic ***Lab Sample ID:*** **042417642-0057A**

Sample Description: Room 8/Tan Cove Base Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 058-Cove Base ***Lab Sample ID:*** **042417642-0058**

Sample Description: Room 9/Dark Brown Vinyl Cove Base

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 058-Mastic ***Lab Sample ID:*** **042417642-0058A**

Sample Description: Room 9/Tan Cove Base Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 059-Insulation ***Lab Sample ID:*** **042417642-0059**

Sample Description: Room 7/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 059-Sealant ***Lab Sample ID:*** **042417642-0059A**

Sample Description: Room 7/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 059-Cloth Wrap ***Lab Sample ID:*** **042417642-0059B**

Sample Description: Room 7/Cloth Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	60.0%	40.0%	None Detected	

Client Sample ID: 060-Insulation ***Lab Sample ID:*** **042417642-0060**

Sample Description: Room 7/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Yellow	95.0%	5.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 060-Sealant **Lab Sample ID:** **042417642-0060A**
Sample Description: Room 7/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 060-Cloth Wrap **Lab Sample ID:** **042417642-0060B**
Sample Description: Room 7/Cloth Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Tan	60.0%	40.0%	None Detected	

Client Sample ID: 061-Insulation **Lab Sample ID:** **042417642-0061**
Sample Description: Room 7/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Yellow	80.0%	20.0%	None Detected	

Client Sample ID: 061-Sealant **Lab Sample ID:** **042417642-0061A**
Sample Description: Room 7/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 061-Cloth Wrap **Lab Sample ID:** **042417642-0061B**
Sample Description: Room 7/Cloth Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Tan	65.0%	35.0%	None Detected	

Client Sample ID: 062 **Lab Sample ID:** **042417642-0062**
Sample Description: Room 1/2x4 Ceiling Tile - Perforated

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	White	80.0%	20.0%	None Detected	

Client Sample ID: 063 **Lab Sample ID:** **042417642-0063**
Sample Description: Room 10/2x4 Ceiling Tile - Perforated

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray/White	80.0%	20.0%	None Detected	

Client Sample ID: 064 **Lab Sample ID:** **042417642-0064**
Sample Description: Room 7 - Interior Door Frame - East/Gray Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.00%	99.25%	**0.75% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 065 ***Lab Sample ID:*** **042417642-0065**

Sample Description: Room 7 - Interior Door Frame - East/Gray Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray	0.0%	95.0%	**5% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.0%	98.8%	**1.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 066 ***Lab Sample ID:*** **042417642-0066**

Sample Description: Room 7 - Interior Door Frame - West/Gray Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.0%	98.3%	**1.75% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 067 ***Lab Sample ID:*** **042417642-0067**

Sample Description: Room 7 - Interior Door Frame - West/Gray Door Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray	0.0%	97.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.0%	98.8%	**1.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 068 ***Lab Sample ID:*** **042417642-0068**

Sample Description: Room 3 - Interior Windows/Gray Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/30/2024	Gray	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.00%	99.75%	**0.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 069 ***Lab Sample ID:*** **042417642-0069**

Sample Description: Room 3 - Interior Windows/Gray Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/04/2024	Gray	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.00%	99.25%	**0.75% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 070 ***Lab Sample ID:*** **042417642-0070**

Sample Description: Room 3 - Exterior Windows/Gray Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.0%	98.5%	**1.50% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 071 ***Lab Sample ID:*** **042417642-0071**

Sample Description: Room 3 - Exterior Windows/Gray Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	0.0%	97.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.0%	98.8%	**1.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 072 ***Lab Sample ID:*** **042417642-0072**

Sample Description: Room 7 - Door Near Garage/Gray Door Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 073 ***Lab Sample ID:*** **042417642-0073**

Sample Description: Room 7 - Door Near Garage/Gray Door Window Glaze

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 074-Drywall ***Lab Sample ID:*** **042417642-0074**

Sample Description: Room 9/Drywall

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	White	15.0%	85.0%	None Detected	

Client Sample ID: 074-Joint Compound ***Lab Sample ID:*** **042417642-0074A**

Sample Description: Room 9/White Joint Compound

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 075-Drywall ***Lab Sample ID:*** **042417642-0075**

Sample Description: Room 9/Drywall

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Tan/White	10.0%	90.0%	None Detected	

Client Sample ID: 075-Joint Compound ***Lab Sample ID:*** **042417642-0075A**

Sample Description: Room 9/White Joint Compound

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 076 ***Lab Sample ID:*** **042417642-0076**

Sample Description: Room 7 - Exterior/Security Glass Mortar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Tan	0.0%	100.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 077 ***Lab Sample ID:*** **042417642-0077**

Sample Description: Room 7 - Exterior/Security Glass Mortar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Tan	0.0%	100.0%	None Detected	

Client Sample ID: 078 ***Lab Sample ID:*** **042417642-0078**

Sample Description: Room 6/Brown Duct Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 079 ***Lab Sample ID:*** **042417642-0079**

Sample Description: Room 6/Brown Duct Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 080 ***Lab Sample ID:*** **042417642-0080**

Sample Description: Room 4/Gray Floor Epoxy

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	0.0%	97.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.00%	99.50%	**0.50% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 081 ***Lab Sample ID:*** **042417642-0081**

Sample Description: Room 4/Gray Floor Epoxy

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	0.0%	100.0%	**<1% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Gray	0.00%	99.75%	**0.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 082-Insulation ***Lab Sample ID:*** **042417642-0082**

Sample Description: Room 11 - Right/Yellow Fiberglass Pipe Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 082-Sealant ***Lab Sample ID:*** **042417642-0082A**

Sample Description: Room 11 - Right/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray/White	0.0%	100.0%	None Detected	

Client Sample ID: 082-Cloth Wrap ***Lab Sample ID:*** **042417642-0082B**

Sample Description: Room 11 - Right/Cloth Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Tan	60.0%	40.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 083-Insulation **Lab Sample ID:** **042417642-0083**

Sample Description: Room 11 - Left/Yellow Fiberglass Pipe Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Yellow	70.0%	30.0%	None Detected	

Client Sample ID: 083-Sealant **Lab Sample ID:** **042417642-0083A**

Sample Description: Room 11 - Left/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	White	10.0%	90.0%	None Detected	

Client Sample ID: 084 **Lab Sample ID:** **042417642-0084**

Sample Description: Exterior Door/Window Frame of Room 4/White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	White	2.0%	98.0%	None Detected	

Client Sample ID: 085 **Lab Sample ID:** **042417642-0085**

Sample Description: Exterior Door/Window Frame of Room 4/White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 086 **Lab Sample ID:** **042417642-0086**

Sample Description: Exterior Door Caulk of Room 6/White Door Frame Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 087 **Lab Sample ID:** **042417642-0087**

Sample Description: Exterior Door Caulk of Room 6/White Door Frame Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	White	0.0%	100.0%	None Detected	

Client Sample ID: 088 **Lab Sample ID:** **042417642-0088**

Sample Description: Exterior Doorsill - Front Entrance/Red Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Red	3.0%	97.0%	None Detected	

Client Sample ID: 089 **Lab Sample ID:** **042417642-0089**

Sample Description: Exterior Doorsill - Front Entrance/Red Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Red	0.0%	100.0%	None Detected	

Client Sample ID: 090 **Lab Sample ID:** **042417642-0090**

Sample Description: West Wall Exterior - Wall to Sidewalk/Black Expansion Joint w/Stones

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Black	30.0%	70.0%	None Detected	

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 091 ***Lab Sample ID:*** **042417642-0091**

Sample Description: South Wall Exterior - Wall to Sidewalk/Black Expansion Joint w/Stones

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Black	8.0%	92.0%	None Detected	

Client Sample ID: 092 ***Lab Sample ID:*** **042417642-0092**

Sample Description: Door of Room 4 - Exterior/Gray Door Sill Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 093 ***Lab Sample ID:*** **042417642-0093**

Sample Description: Door of Room 4 - Exterior/Gray Door Sill Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 094 ***Lab Sample ID:*** **042417642-0094**

Sample Description: Entry of Room 4 - Exterior/Brown Window Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Black	6.0%	91.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Black	0.0%	97.8%	**2.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 095 ***Lab Sample ID:*** **042417642-0095**

Sample Description: Entry of Room 4 - Exterior/Brown Window Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Brown	0.0%	100.0%	None Detected	

Client Sample ID: 096 ***Lab Sample ID:*** **042417642-0096**

Sample Description: Front Entrance/Black Door Frame Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Black	3.0%	95.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Black	0.0%	97.5%	**2.50% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 097 ***Lab Sample ID:*** **042417642-0097**

Sample Description: Front Entrance/Black Door Frame Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Black	0.0%	97.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Black	0.0%	98.8%	**1.25% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

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Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 098 ***Lab Sample ID:*** **042417642-0098**

Sample Description: North Exterior Wall - Concrete under Security Window/White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Brown/White	0.0%	97.0%	**3% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Brown/White	0.00%	99.50%	**0.50% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 099 ***Lab Sample ID:*** **042417642-0099**

Sample Description: West Exterior Wall - Concrete under Security Window/White Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Brown/White	0.0%	98.0%	**2% Chrysotile**	
400 PLM Pt Ct	09/09/2024	Brown/White	0.00%	99.25%	**0.75% Chrysotile**	Point Count performed on NOB material without gravimetric reduction at client request. Asbestos results may be under-reported.

Client Sample ID: 100 ***Lab Sample ID:*** **042417642-0100**

Sample Description: Near East Garage of Room 7/Black Expansion Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 101 ***Lab Sample ID:*** **042417642-0101**

Sample Description: Near East Garage of Room 7/Black Expansion Caulk

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Black	0.0%	100.0%	None Detected	

Client Sample ID: 102-Sealant ***Lab Sample ID:*** **042417642-0102**

Sample Description: Room 14/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 102-Thermal Layer ***Lab Sample ID:*** **042417642-0102A**

Sample Description: Room 14/Thermal Layer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Gray	55.0%	45.0%	None Detected	

Client Sample ID: 102-Wrap ***Lab Sample ID:*** **042417642-0102B**

Sample Description: Room 14/Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Tan	60.0%	40.0%	None Detected	

Client Sample ID: 102C-Insulation ***Lab Sample ID:*** **042417642-0102C**

Sample Description: Room 14/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Yellow	95.0%	5.0%	None Detected	

EMSL Analytical, Inc.

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Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order ID:	042417642
Customer ID:	RESI25
Customer PO:	B24-018
Project ID:	

Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 103-Sealant **Lab Sample ID:** **042417642-0103**
Sample Description: Room 14/Pipe End Sealant

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	0.0%	100.0%	None Detected	

Client Sample ID: 103-Thermal Layer **Lab Sample ID:** **042417642-0103A**
Sample Description: Room 14/Thermal Layer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	20.0%	80.0%	None Detected	

Client Sample ID: 103-Wrap **Lab Sample ID:** **042417642-0103B**
Sample Description: Room 14/Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	45.0%	55.0%	None Detected	

Client Sample ID: 103-Insulation **Lab Sample ID:** **042417642-0103C**
Sample Description: Room 14/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Yellow	80.0%	20.0%	None Detected	

Client Sample ID: 104-Pipe Fitting **Lab Sample ID:** **042417642-0104**
Sample Description: Lower Fitting - Room 14/Pipe Fitting

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024				Layer Not Present	

Client Sample ID: 104-Wrap **Lab Sample ID:** **042417642-0104A**
Sample Description: Lower Fitting - Room 14/Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Tan	60.0%	40.0%	None Detected	

Client Sample ID: 104-Thermal Layer **Lab Sample ID:** **042417642-0104B**
Sample Description: Lower Fitting - Room 14/Thermal Layer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Tan	70.0%	30.0%	None Detected	

Client Sample ID: 104-Insulation **Lab Sample ID:** **042417642-0104C**
Sample Description: Lower Fitting - Room 14/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	08/31/2024	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: 105-Pipe Fitting **Lab Sample ID:** **042417642-0105**
Sample Description: Upper Fitting - Room 14/Pipe Fitting

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024				Layer Not Present	

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http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order ID:	042417642
Customer ID:	RESI25
Customer PO:	B24-018
Project ID:	

Summary Test Report for Asbestos Analysis of Bulk Material

Client Sample ID: 105-Wrap ***Lab Sample ID:*** **042417642-0105A**

Sample Description: Upper Fitting - Room 14/Wrap

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Tan	50.0%	50.0%	None Detected	

Client Sample ID: 105-Thermal Layer ***Lab Sample ID:*** **042417642-0105B**

Sample Description: Upper Fitting - Room 14/Thermal Layer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Gray	30.0%	70.0%	None Detected	

Client Sample ID: 105-Insulation ***Lab Sample ID:*** **042417642-0105C**

Sample Description: Upper Fitting - Room 14/Yellow Fiberglass Insulation

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	09/05/2024	Yellow	85.0%	15.0%	None Detected	

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EMSL Order ID:	042417642
Customer ID:	RESI25
Customer PO:	B24-018
Project ID:	

Attn: Michelle Eckels
Resource International
6350 Presidential Gateway
Columbus, OH 43231

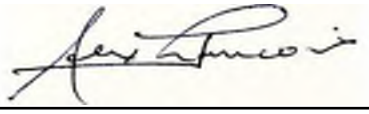
Phone: (614) 390-5988
Fax: (614) 823-4990
Collected:
Received: 8/22/2024
Analyzed: 9/09/2024

Proj: B-24-018 / Preble Maintenance Facility

The samples in this report were submitted for asbestos bulk analysis. The reference number for these samples is the Order ID above. Please use this reference number when calling about these samples.

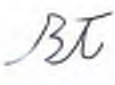
Sample Receipt Date: 08/22/2024
Sample Receipt Time: 12:15 pm
Analysis Completed Date: 09/09/2024
Analysis Completed Time: 8:02 pm

Analyst(s):



Alex Francois 400 PLM Pt Ct (9)

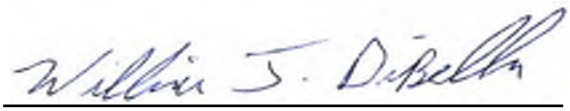
Amiri Lewis PLM (77)



Brett Teixeira PLM (12)

Megan Bosch PLM (25)

Selbbep Salgado PLM (34)



Will DiBella 400 PLM Pt Ct (8)

Reviewed and approved by:

Samantha Rundstrom, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This is a summary report; official reports are available on LabConnect or upon request and relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA LAP, LLC-IHLAP Lab 100194, PA ID# 68-00367, LA #04127

Report amended: 09/09/202422:30:42 Replaces initial report from: 09/05/202414:19:40 Reason Code: Client-Additional Analysis

OrderID: 042417642

Asbestos Chain of Custody (Air, Bulk, Soil)

EMSL Order Number / Lab Use Only: 042417642

EMSL ANALYTICAL, INC.
TESTING LABS • PRODUCTS • TRAINING

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: (800) 220-3675
EMAIL: CinnAstab@EMSL.com

RECEIVED EMSL CINNAMINSON, N.J. 2024 AUG 22 P 12:14

If Bill-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information

Customer ID:	
Company Name:	Resource International, Inc.
Contact Name:	Michelle Eckels
Street Address:	6350 Presidential Gateway
City, State, Zip:	Columbus, OH 43231
Country:	USA
Phone:	614-823-4949
Email(s) for Report:	michellee@resourceinternational.com

Billing Information

Billing ID:	
Company Name:	
Billing Contact:	
Street Address:	
City, State, Zip:	
Country:	
Phone:	
Email(s) for Invoice:	

Project Information

Project Name/No:	B-24-018 Preble Maintenance Facility
Purchase Order:	
EMSL LIMS Project ID: (If applicable, EMSL will provide)	
US State where samples collected:	OH
State of Connecticut (CT) must select project location:	☐ Commercial (Taxable) ☐ Residential (Non-Taxable)
Sampled By Name:	Zachary Hamilton
Sampled By Signature:	
No. of Samples in Shipment	105

Turn-Around-Time (TAT)

☐ 3 Hour ☐ 4-4.5 Hour AHERA ONLY ☐ 6 Hour ☐ 24 Hour ☐ 32 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ☐ 1 Week ☑ 2 Week

TEM Air 3-6 Hour, please call ahead to schedule. 32 Hour TAT available for select tests only; samples must be submitted by 11:30 am.

Test Selection

PCM Air
- ☐ NIOSH 7400
- ☐ NIOSH 7400 w/ 8hr. TWA

PLM - Bulk (reporting limit)
- ☑ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)
- ☐ POINT COUNT
  - ☐ 400 (<0.25%) ☐ 1,000 (<0.1%)
- POINT COUNT w/ GRAVIMETRIC
  - ☐ 400 (<0.25%) ☐ 1,000 (<0.1%)
- ☐ NIOSH 9002 (<1%)
- ☐ NYS 198.1 (Friable - NY)
- ☐ NYS 198.6 NOB (Non-Friable - NY)
- ☐ NYS 198.8 (Vermiculite SM-V)

TEM - Air
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312*

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (Non-Friable-NY)
- ☐ TEM EPA 600/R-93/116 w Milling Prep (0.1%)

Other Test (please specify)

TEM - Settled Dust
- ☐ Microvac - ASTM D5755
- ☐ Wipe - ASTM D6480
- ☐ Qualitative via Filtration Prep
- ☐ Qualitative via Drop Mount Prep

Soil - Rock - Vermiculite (reporting limit)*
- ☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
- ☐ PLM EPA 600/R-93/116 with milling prep (<0.1%)
- ☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
- ☐ TEM Qualitative via Filtration Prep
- ☐ TEM Qualitative via Drop Mount Prep

*Please call with your project-specific requirements.

☐ Positive Stop - Clearly Identified Homogeneous Areas (HA) | Filter Pore Size (Air Samples) ☐ 0.8um ☐ 0.45um

Sample Number	Sample Location / Description	Volume, Area or Homogeneous Area	Date / Time Sampled (Air Monitoring Only)
001 thru 105	See Attached		

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

2-wk PLM

105 ok

Method of Shipment:	UPS	Sample Condition Upon Receipt:	
Relinquished by:		Date/Time: 8-20-24 @1600	Received by: Chelsea UPS
Relinquished by:		Date/Time:	Received by:

Date/Time: 8/22/24 9?0

Controlled Document - COC-05 Asbestos R16 10/26/2021

☐ AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.

CHAIN-OF-CUSTODY

042417642

p1 of 11
Rii

RESOURCE INTERNATIONAL, INC.
6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: Preble maintenance Facility

Site Location:

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	001	light yellow fg wall insulation	Trailer - inside right wall			
	002					
					Qty:	
	003	Drywall ceiling w/ textured finish	Trailer			
	004					
					Qty:	
	005	yellow fg wall insulation	Trailer - wall to exterior			
	006					
					Qty:	
	007	yellow fg duct insulation	Trailer			
	008					
					Qty:	
	009	12x12 F.T. Gray & Tan clear mastic	Trailer			
	010					
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to:
[signature]	8.20.2024	UPS# 1Z8019F207 9231 4856			Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231
Relinquished by:	Date:	Received by: UPS	Date: 8/22/24 1215p		Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels

Comments: Analyze each distinct layer.

OrderID: 042417642

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042417642

P2

RESOURCE INTERNATIONAL, INC.
6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24.018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	011	White window caulk	NW window of trailer			
	012		NE window of trailer			
					Qty:	
	013	Gray caulk	W wall of trailer - under electric box			
	014		↓			
					Qty:	
	015	Silver roof sealant	edge of roof - trailer			
	016					
					Qty:	
	017	Black silicone caulk	↓			
	018					
					Qty:	
	019	Yellow foam insulation	small sump structure - walls			
	020					
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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042417642

p3

RESOURCE INTERNATIONAL, INC.

6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	021	Shingle paper	SAH dome roof			
	022					
					Qty:	
	023	White membrane roof decking Tar Blue styrofoam Stone w/ Tar fiber board - brown	upper roof center			
	024		South lower roof - NW corner			
					Qty:	
	025	Brown caulk	soffit - upper roof			
	026		soffit - upper roof			
					Qty:	
	027	White drain pipe caulk	roof of main building			
	028					
					Qty:	
	029	Red pipe caulk	roof of main building			
	030					
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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042417642

P 4

RESOURCE INTERNATIONAL, INC.
6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	031	tan & white caulk	drip line of lower roof			
	032		drip line of upper roof			
					Qty:	
	033 ✓	12x12 F.T. Tan w/ Brown mottle	Rm 9			
	034 ✓	Black mastic	Rm 10			
					Qty:	
	035 ✓	Brown Vinyl Cove base	Rm 8			
	036 ✓		Rm 8			
					Qty:	
	037 ✓	2x4 Ceiling tile - textured	Rm 9			
	038 ✓					
					Qty:	
	039 ✓	2x4 Ceiling - Randomperforations	Rm 8			
	040 ✓		Rm 8 - Outside hall			
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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P5

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6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	041 ✓ 042 ✓	12x12 F.T. Tan w/ gray	RM8 Rm9			
					Qty:	
	043 ✓ 044 ✓	Black garage door caulk	Rm6 - exterior door frame 1			
					Qty:	
	045 ✓ 046 ✓	Blue pipe sealant	Rm 7-W Rm-F			
					Qty:	
	047 ✓ 048 ✓	Brown fiber board white vinyl	Rm9 Rm7			
					Qty:	
	049 ✓ 050 ✓	gray caulk - garage door frame	Rm7 1	flexible		
					Qty:	

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Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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p6

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Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	051 ✓	Gray Epoxy	Rm 7			
	052 ✓					
					Qty:	
	053 ✓	Tan door caulk	Rm 5			
	054 ✓					
					Qty:	
	055 ✓	Floor caulk - gray	Rm 7 - garage door meets ground			
	056 ✓					
					Qty:	
	057 ✓	Dark Brown Vinyl cove Base	Rm 8			
	058 ✓	Tan mastic	Rm 9			
					Qty:	
	059 ✓	Yellow fg insulation	Rm 7			
	060 ✓	Pipe end sealant				
	061 ✓	cloth wrap	↓		Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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P7

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6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	062 ✓ 063 ✓	2x4 ceiling tile - perforated	Rm1 Rm10			
					Qty:	
	064 ✓ 065 ✓	Gray Door Caulk	Rm7 - interior doorframe E	flexible		
					Qty:	
	066 ✓ 067 ✓	Gray Door Caulk	Rm7 - interior door frame W	brittle		
					Qty:	
	068 ✓ 069 ✓	Gray Window glaze	Rm3 - interior windows			
					Qty:	
	070 071	Gray window glaze	Rm3 - exterior windows			
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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0424176423

P8

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Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	072	Gray Door window glaze	Rm 7 - W Door near garage			
	073					
					Qty:	
	074	Drywall joint compound - white	Rm 9			
	075		1			
					Qty:	
	076	Security glass mortar	exterior Rm 7			
	077					
					Qty:	
	078	Brown duct mastic	Rm - 6			
	079					
					Qty:	
	080	Gray Floor Epoxy	Rm - 4			
	081		↓			
					Qty:	

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Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

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P9

RESOURCE INTERNATIONAL, INC.

6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	082	Yellow Fg. Pipe insulation	Rm 11 - right			
	083	Pipe end sealant	Rm 11 - left			
					Qty:	
	084	White caulk	Exterior door/window frame at Rm 4			
	085		↓			
					Qty:	
	086	White door frame caulk	Exterior door caulk at Rm 6			
	087					
					Qty:	
	088	Red caulk	Exterior door sill - front entrance			
	089					
					Qty:	
	090	Black expansion joint w/ stones	W wall exterior - wall to sidewalk			
	091		S wall " "			
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

CHAIN-OF-CUSTODY

042417642

P 10

RESOURCE INTERNATIONAL, INC.

6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Friability*
	092	Gray Door Sill caulk	Door of Rm 4 - exterior			
	093		W door of Rm 7 - near garage			
					Qty:	
	094	Brown window caulk	entry of Rm H - exterior			
	095					
					Qty:	
	096	Black door frame caulk	Front entrance			
	097					
					Qty:	
	098	White caulk	N exterior wall - concrete under security window			
	099		W " "			
					Qty:	
	100	Black expansion joint	near E garage of Rm 7			
	101					
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

CHAIN-OF-CUSTODY

042417642

RESOURCE INTERNATIONAL, INC.

6350 Presidential Gateway
Columbus, Ohio 43231
Phone: 614.823.4949
Fax: 614.823.4990

p11

Rii P.O. Number: B-24-018 Project Name: _____

Site Location: _____

HA No.	Bulk Sample I.D. Number	Suspect Material Type	Bulk Sample Locations	Other Homogeneous Locations	Comments and Observation: Condition	Comments and Observation: Friability*
	102	Pipe end sealant- thermal layer, wrap, yellow fg insulation	Rm 14			
	103		1			
					Qty:	
	104	Pipe fitting - wrap, thermal layer, yellow fg insulation	lower fitting - Rm 14			
	105		upper fitting - Rm 14			
					Qty:	
					Qty:	
					Qty:	
					Qty:	

F = Friable NF = Non-friable

Relinquished by:	Date:	Received by:	Date:	Turnaround:	Send laboratory results to: Resource International, Inc. 6350 Presidential Gateway Columbus, OH 43231 Email results to: michellee@resourceinternational.com Hard copy: Michelle Eckels
Relinquished by:	Date:	Received by:	Date:		

Comments: Analyze each distinct layer.

OrderID: 042417642

XRF RESULTS

Project: ODOT Preble Co. Maint Garage

Project #: B-24-018 **Date:** 8.12.2024

Sample Number	Room Number	Building Component	Substrate	Paint Color	Pb (ppm)	Cd	Cr	As
		Calibration		EC 690-M	14	24	ND	5
				EC 691-M	64	114	47	19
1	3 sided pole barn	wall	plywood	white	ND	ND	ND	13
2	3 sided pole barn	storage bin	plywood	gray	1.032%	ND	ND	379
3	3 sided pole barn	downspout	aluminum	white	180	ND	530	ND
4	3 sided pole barn	siding	aluminum	tan	530	ND	8220	ND
5	3 sided pole barn	plank wall	wood	brown	ND	ND	490	16
6	3 sided pole barn	siding	aluminum	gray	ND	ND	9700	ND
7	pump building?	hydraulic tank	metal	black	ND	ND	ND	192
8	small pump building?	pump motor	metal	dark blue	ND	ND	420	ND
9	small pump building	heater unit	metal	white	ND	ND	ND	295
10	3 sided salt barn	I-beam	metal	brown	>10%	ND	1.97%	ND
11	AST Area	ballard	metal	yellow	ND	ND	ND	169
12	AST area	large AST	metal	white	ND	ND	ND	39
13	AST area	pipe	metal	white	ND	ND	ND	32
14	trailer south of building	exterior siding	aluminum	taupe	ND	ND	330	26

XRF Results

XRF RESULTS

Project: ODOT Preble Co. Maintenance Garage

Project #: B-24-018 **Date:** 8/12/2024

Sample Number	Room Number	Building Component	Substrate	Paint Color	Pb (ppm)	Cd	Cr	As
15	trailer south of building	exterior trim	aluminum	white	ND	ND	7,310	ND
16	trailer south of building	exterior window frame	metal	dark brown	ND	ND	510	15
17	trailer south of building	trailer skirt	aluminum	tan	ND	ND	1.034%	ND
18	trailer south of building	door exterior	aluminum	white	1,990	ND	2,330	ND
19	trailer interior	ceiling	drywall	white	ND	ND	ND	17
20	trailer interior	door trim	wood	brown	ND	ND	ND	19
21	trailer interior	vent duct	metal	white	ND	ND	ND	ND
22	trailer interior	vent duct	metal	brown	420	ND	ND	ND
23	exterior main building	exterior walls	CMU	tan	ND	ND	ND	44
24		exterior door	metal	dark blue	ND	ND	ND	11
25		exterior window framing	CMU	brown	ND	ND	2,970	30
26		picnic table	wood	dark brown	ND	ND	4,170	398
27		west wall	CMU	tan	ND	ND	ND	31
28	exterior	door	metal	brown	630	ND	3.26%	220
29	exterior	west wall door frame	CMU	brown	ND	ND	7590	19

XRF RESULTS

Project: _____

Project #: _____ **Date:** _____

Sample Number	Room Number	Building Component	Substrate	Paint Color	Pb	Cd	Cr	As
30	front entrance	floor	concrete	grey speckled	ND	ND	ND	23
31	front entrance	door frame	metal	dark tan	ND	ND	1.44%	140
32	front entrance	door	metal	cream	1760	ND	1.32%	225
33	1	heater	metal	white	ND	ND	ND	120
34	1	wall	CMU	white	ND	ND	ND	41
35	2	wall	drywall	tan	ND	ND	ND	13
36	3	window frame	wood	white	ND	ND	ND	22
37	4	floor	cement	dark gray speckled	ND	ND	ND	28
38	5	door	metal	gray	460	ND	ND	144
39	5	floor	cement	gray	ND	ND	2,750	27
40	5	floor	cement	green	ND	ND	2.13%	22
41	6	wall	CMU	gray	ND	ND	4560	21
42	6	door	metal	light gray	390	ND	ND	57
43	6	car lift	metal	red	ND	ND	ND	262
44	6	work station	wood	green	975	ND	1.542%	29

XRF RESULTS

Project: _____

Project #: _____ **Date:** _____

Sample Number	Room Number	Building Component	Substrate	Paint Color	Pb	Cd	Cr	45
45	7	door	metal	light green	530	ND	ND	203
46	7	wall next to door from room 6	CMU	light green	ND	ND	ND	33
47	7	tire rack	metal	red	>10%	ND	2.46%	ND
48	7	wall behind fire extinguisher	CMU	red	ND	ND	ND	24
49	7	floor lines	concrete	yellow	ND	ND	ND	14
50	7	floor	concrete	gray	ND	ND	ND	5
51	7	floor lines	concrete	white	ND	ND	ND	11
52	7	I-beam	metal	dark gray	1.009%	ND	1.52%	ND
53	7	Paint storage cabinet	wood	green	ND	ND	ND	3
54	7	staircase	metal	dark gray	ND	ND	ND	217
55	7	wall (505)	CMU	black	ND	ND	ND	33
56	7 (up staircase)	sign	wood	tan	ND	ND	ND	6
57	7 (up staircase)	I-beam	metal	red	1.0%	ND	3.44%	ND
58	11	lockers in men's restroom	metal	light green	170	ND	ND	ND
59	9	wall behind fire extinguisher	CMU	red	ND	ND	ND	32

XRF RESULTS

Project: _____

Project #: _____ **Date:** _____

Sample Number	Room Number	Building Component	Substrate	Paint Color	Pb	Cd	Cr	As
60	9	wall above kitchenette	drywall	tan	ND	ND	ND	37
61	14 (generator room)	on pipe	pipe insulation	gray	326	ND	ND	93
62	14	pump valve	metal	blue	ND	ND	ND	332
63	14	file cabinet	metal	brown	4.96%	ND	6,300	ND
64	14	wall	wood	black	ND	ND	ND	ND
65	14	main switch panel	metal	white	1.5%	ND	ND	ND
66	exterior west wall	ballards	metal	red/orange	2.27%	ND	ND	ND
67	exterior west wall	exterior piping	metal	brown	1,260	ND	1.9%	117
68	exterior east wall	garage door	metal	gray	ND	ND	4,540	ND
69	exterior south side	downspout	aluminum	white	168	ND	350	ND
		Calibration		EC1080-M	9	ND	ND	16
				EC1081-M	105	127	59	20

APPENDIX D

CERTIFICATIONS AND LABORATORY ACCREDITATIONS

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

11/29/2023

Katherine Bossert
Resource International
6350 Presidential Gateway
Columbus, OH 43231

RE: Evaluation Specialist
Certification Number: ES549481
Expiration Date: 11/27/2024

Dear Katherine Bossert:

This letter and enclosed certification card approves your request to be certified as an asbestos Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Ohio Environmental Protection Agency (EPA) for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please contact the Asbestos Program at 614-644-0226 or by email at asbestoslicensing@epa.ohio.gov.

Sincerely,

Brandon M. Schwendeman

Brandon Schwendeman
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

9/11/2023

Zachary Hamilton
Resource International, Inc.
6350 Presidential Gateway
Columbus, OH 43231

RE: Evaluation Specialist
Certification Number: ES34150
Expiration Date: 10/9/2024

Dear Zachary Hamilton:

This letter and enclosed certification card approves your request to be certified as an asbestos Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Ohio Environmental Protection Agency (EPA) for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please contact the Asbestos Program at 614-644-0226 or by email at asbestoslicensing@epa.ohio.gov.

Sincerely,

Brandon M. Schwendeman

Brandon Schwendeman
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control

State of Ohio
Environmental Protection Agency
Asbestos Program

Asbestos Hazard Evaluation Specialist

Zachary
Hamilton

Resource International, Inc.
6350 Presidential Gateway
Columbus OH 43231

DOB: 2/2/77

Card not Valid if Altered

Certification Number Expiration Date
ES34150 10/9/24

• Suite 700 • P.O. Box 1049 • Columbus, OH 43216-1049
.gov • (614) 644-3020 • (614) 644-3184 (fax)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

2/21/2024

Michelle Eckels
Resource International, Inc.
6350 Presidential Gateway
Columbus, OH 43231

RE: Evaluation Specialist
Certification Number: ES33141
Expiration Date: 2/21/2025

Dear Michelle Eckels:

This letter and enclosed certification card approves your request to be certified as an asbestos Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Ohio Environmental Protection Agency (EPA) for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please contact the Asbestos Program at 614-644-0226 or by email at asbestoslicensing@epa.ohio.gov.

Sincerely,

Brandon M. Schwendeman
Brandon Schwendeman
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control

State of Ohio
Environmental Protection Agency
Asbestos Program

Asbestos Hazard Evaluation Specialist

Michelle L Eckels

Resource International, Inc.
6350 Presidential Gateway
Columbus OH 43231

DOB: 2/2/70

Card not Valid if Altered

Certification Number	Expiration Date
ES33141	2/21/25

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101048-0

EMSL Analytical, Inc.

Cinnaminson, NJ

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2024-07-01 through 2025-06-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
Ms. Samantha Rundstrom
Phone: 856-303-2577
Email: srundstrom@emsl.com
http://www.emsl.com

ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 101048-0**

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

APPENDIX E

NOTIFICATION FORMS

Notification of Demolition and Renovation/Abatement

Section 1: General Information

Division of Air Pollution Control

Work on projects cannot begin until 10 working days after a COMPLETE original notification form, **including payment**, is submitted to Ohio EPA. Instructions and a worksheet for fee calculation are available at ***epa.ohio.gov/asbestos***. This form can be completed, and payment made, at ***ebiz.epa.ohio.gov***. Questions? ***asbestos@epa.ohio.gov*** or (614) 466-0061.

Ohio EPA Use Only	Notification #:	Postmarked: / /	Received: / /	☐ Hand-Delivered

1) Notification Information (Check all that apply)

☐ Original	☐ Revision # (count):	☐ Installation	☐ Emergency	☐ Annual	☐ Cancellation	County:

2) Owner, Asbestos Abatement Contractor, Billing and Fire Department Information **Revised?** ☐

Owner		
Name:		Is this a company? ☐ Yes ☐ No
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -
Asbestos Abatement Contractor (if applicable)		
Name:	License #: AC	Expiration Date: / /
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -
Billing Contact		
Is this contact associated with the ☐ Owner, ☐ Asbestos Abatement Contractor, or ☐ Demolition Contractor (if not installation)?		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -
Fire Department (if applicable)		
Name:		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -

3) Ohio Asbestos Hazard Evaluation Specialist and Evaluation Procedure **Revised?** ☐

Evaluation Specialist:	Certification #: ES	Expiration Date: / /

Procedure, including analytical methods, employed to detect the presence of and to estimate the quantity of regulated asbestos-containing material (RACM) and Category I and Category II non-friable asbestos-containing material: ☐ PLM ☐ Point Count ☐ TEM ☐ Other Method (Explain Below):

4) Procedures to be followed should unexpected RACM be discovered (check all that apply) **Revised?** ☐

☐ Stop work and keep wet	☐ Evacuate area	☐ Demarcate area	☐ Contact licensed abatement contractor
☐ Contact district office/local air authority			
☐ Other (Explain):			

5) Planned Demolition (check all that apply) **Revised?** ☐

Describe demolition work to be performed and method(s) to be employed, including demolition techniques to be used:
☐ Implosion ☐ Fire Training ☐ Wet Methods ☐ Manual Demolition ☐ Mechanical Demolition ☐ Other (Explain):

Description of affected facility components (include attachment if necessary):

Mail completed form and payment to:
Ohio EPA, DAPC – Asbestos
50 W. Town St., 7th Floor or P.O. Box 1049
Columbus, OH 43216-1049

Notification of Demolition and Renovation/Abatement

Section 1: General Information

Continued

6) Asbestos Description and Engineering Controls (if asbestos is being abated) **Revised?** ☐

For the material listed in each project, describe the type(s) of ACM to be abated, engineering controls and work practices to be used to minimize emissions and ensure proper waste handling:					
Type of ACM to be abated:	☐ Surfacing	☐ Mechanical	☐ Other		
Engineering Controls:	☐ Wet Methods	☐ Glove Bag	☐ NPE	☐ AFD	☐ Other:
Work Practices:	☐ Intact Removal	☐ Manual	☐ Mechanical	☐ Other:	

7) Asbestos Waste Transporter (if applicable) **Revised?** ☐

Transporter #1 Name:		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -
Transporter #2 Name (if applicable):		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -

8) Asbestos Waste Disposal Site (if applicable) **Revised?** ☐

Name:		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -

9) Emergency Demolition (complete if you checked "Emergency" above and "Demolition" for any project) **Revised?** ☐

A copy of the issued order, including the following information, **must be attached** to this notification.	
Government Official Issuing Order:	Title:
Agency:	Authority of Order (Citation of Code):
Date of Order: / /	Demolition Date: / /

10) Emergency Renovation/Abatement (complete if you checked "Emergency" above and "Renovation/Abatement" for any project) **Revised?** ☐

Date of Emergency: / /	Time of Emergency: : ☐ a.m. ☐ p.m.
Description of Sudden, Unexpected Event:	
Explanation of how the event caused unsafe conditions or equipment damage:	

11) Attestation **Revised?** ☐

In accordance with Ohio Administrative Code rule 3745-20-03(A)(4)(p), I certify that at least one person trained as required by paragraph (B) of rule 3745-20-04 of the Administrative Code will supervise the stripping and removal described by this notification. I acknowledge that the submission of false or misleading statements is prohibited by law and I certify that facts contained in this notification are true, accurate, and complete.	
Signature:	Date: / /
Name:	Title:
Organization:	

Notification of Demolition and Renovation/Abatement

Section 2: Project Address Specific Information

Division of Air Pollution Control

Please complete Section 2 for the address included with this notification. If the project is an "Installation" per OAC 3745-20, complete a separate Section 2 page for each address associated with this notification.

Ohio EPA Use Only	Project ID #:

A. Facility Description **Revised?** ☐

Building Name (if applicable):	Site Location (specific):	
Address:		County:
City:	State: OH	Zip: -
Building Size (square feet):	No. of Floors:	Age:
Present Use:	Prior Use:	

B. Type of Operation (check all that apply) **Revised?** ☐

☐ Demolition	☐ Renovation/Abatement – Type: ☐ Removal ☐ Repair ☐ Encapsulation ☐ Enclosure

C. Asbestos Present (check one) **Revised?** ☐

☐ Yes	☐ No	☐ No, previously abated Year Abated:

D. Approximate Amount of Asbestos-Containing Materials (complete table below and Section 1 #6 if asbestos is present) **Revised?** ☐

	Material to be Removed			Material NOT to be Removed	
		Non-friable Asbestos-Containing Material		Non-friable Asbestos-Containing Material	
	RACM	Category I	Category II	Category I	Category II
Pipes (linear feet)					
Surface area on other facility components (ft^2)					
Volume if length or area cannot be measured (ft^3)					

E. Asbestos Abatement Schedule and Abatement Specialist (original notification is required 10 working days prior to the start of work) **Revised?** ☐

Setup Date: / /		Abatement Date: / /			Complete Date: / /		
(Shift 1) Time start/end on site	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Abatement Specialist Name:			Certification #: AS			Expiration Date: / /	
(Shift 1) Time start/end on site	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Abatement Specialist Name:			Certification #: AS			Expiration Date: / /	

F. Demolition Contractor (if applicable) **Revised?** ☐

Name:		
Address:	Contact Person:	
City:	State:	Zip: -
Email:	Phone: ( ) -	Fax: ( ) -

G. Demolition Schedule (original notification is required 10 working days prior to the start of work) **Revised?** ☐

Start Date: / /	Complete Date: / /

H. Project Hold **Revised?** ☐

Hold Begin Date: / /	Work Resume Date: / /

OHIO ENVIRONMENTAL PROTECTION AGENCY
INSTRUCTIONS FOR COMPLETING
NOTIFICATION OF DEMOLITION AND RENOVATION/ABATEMENT FORM

General Information

These directions are for submitting hardcopy notifications to the Ohio EPA. Ohio EPA strongly encourages notifications to be submitted electronically via the Ohio EPA eBusiness Center located at ebiz.epa.ohio.gov.

Who must submit this notification? *[OAC 3745-20-03 and OAC 3745-22-04(C)(4)]*

- The owner or operator means any person who leases, operates, controls, or supervises the facility being demolished or renovated, or any person who owns, leases, operates, controls or supervises the demolition or renovation (activity), or both.
- Asbestos Abatement Contractor means a contractor who is currently licensed by the Ohio EPA as an Asbestos Hazard Abatement Contractor.

The Ohio EPA notification of demolition and renovation form is required for:

- Every demolition of a facility, regardless of whether asbestos is involved. This includes all structures that will be intentionally burned for fire training purposes.
- A renovation when the amount of regulated asbestos-containing material (RACM) stripped, removed, dislodged, cut, drilled, or similarly disturbed exceeds 260 linear feet on pipes or 160 square feet on other facility components or 35 cubic feet off facility components.
- An abatement when the activity involves the removal, renovation, enclosure, repair or encapsulation of friable asbestos-containing material in an amount greater than 50 linear feet on pipes or 50 square feet on other facility components.

When must I submit this notification?

ORIGINAL: The original notification must be **postmarked** or **hand delivered** to the Ohio EPA Central Office at least 10 working days (Monday-Friday excluding weekends) before operations begin. Please see example table below to help determine when to submit the original notification.
E-mail or FAX is not acceptable for original notification.

July

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3 day 1	4 day 2	5 day 3	6
7	8 day 4	9 day 5	10 day 6	11 day 7	12 day 8	13
14	15 day 9	16 day 10	17 *	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Post mark date (and Day 1 of 10-day clock): July 3rd.
Note: Holidays are counted when they fall on a working day.
Completion of 10-day prior notification period: July 16th.
* First day work can commence (day following the 10th working day): July 17th.

REVISIONS: A revised notification must be submitted if there is any change in the notification which renders information in the notification no longer accurate. Examples of changes include but are not limited to: if the amount of RACM changes by at least 20 percent, any changes in work schedules (dates or hours), any change in owner or operator, a change in the asbestos hazard abatement specialist onsite, or any change in the name or location of selected waste disposal site. A revised notification may be initiated by phone, however, must be followed in writing by either email or fax. Revisions shall be submitted as soon as possible but not later than one working day following discovery of the change.

EMERGENCY DEMOLITION OR RENOVATIONS: The notification must be submitted as early as possible before, but not later than, the following working day from start of demolition or renovation/abatement activities. The notification must include the supplemental information required in Sections 9 or 10.

Where do I send my notification?

Send the notification to: Ohio EPA Central Office, Division of Air Pollution Control, P.O. Box 1049, Columbus, Ohio 43216-1049.

How does Ohio EPA assess fees? [*ORC 3745.11(G) and OAC 3745-22-04(C)*]

Per ORC 3745.11(G), an owner or operator who is responsible for an asbestos demolition or renovation/abatement project regulated under OAC Chapter 3745-20, shall pay the fees set forth in the following schedule. This applies when thresholds are greater than or equal to: 260 linear feet; 160 square feet; or 35 cubic feet.

- Each notification $75 plus,
- Asbestos removal $3/unit (1 unit = any combination of linear feet or square feet equal to fifty) and/or
- Asbestos cleanup $4/cubic yard

Per OAC 3745-22-04(C), if the renovation/abatement project involves removal, encapsulation, enclosure or repair of greater than 50 square feet or 50 linear feet of RACM, the Ohio EPA licensed asbestos hazard abatement contractor is responsible for paying the fees set forth in the following schedule.

- If notification is not an installation, $65 fee, or
- If notification is an installation, $65 fee for each address where RACM exceeds 50 square feet or 50 linear feet.

The fees shall be submitted with the original notification. Projects may be subject to both regulatory fee requirements above. Please be aware that some local air agencies may have additional fees.

Who can help answer questions about completing this notification?

Contact the Ohio EPA Central Office at 614-466-0061 or by email at asbestos@epa.ohio.gov.

Line-by-line Instructions

[Below listed instructions are for hardcopy form submission only]

Section 1: General Information

1. Check the type of notification (all that apply):

- "Original" is the first notification submitted for a project; hardcopy is required to be post-marked or hand-delivered 10 working-days prior to start of work.

- "Revision" is any notification submitted after the original due to any change which renders information on the form no longer accurate. Examples of changes requiring a revision include but are not limited to: if the amount of RACM changes by at least 20 percent, any changes in work schedules (dates or hours), any change in owner or operator, a change in the asbestos hazard abatement specialist onsite, or any change in the name or location of selected waste disposal site. Revisions shall be numbered chronologically with Revision #1 being the first time any items on the notification form were changed. If revision is marked, please include the Revision # and check the "Revised" box for each section where information is revised. A "Revised" box is located near the upper right hand side of each section throughout the form.

- "Installation" means any building or structure or any group of buildings or structures at a single demolition or renovation/abatement site that are under the control of the same owner or operator, or owner or operator under common control. This would include projects where multiple addresses are included in a common project, have the same owner, and are being completed in the same county (i.e. land banks, residential cooperatives, highway projects involving multiple facility demolitions, etc.). If the project includes more than one structure or address, be sure to complete a separate "Section 2: Project Address Specific Information" page for each address.

- "Emergency" includes emergency demolitions and emergency renovation/abatement operations. Emergency demolition means any demolition operation conducted under a written order issued by a state or local governmental agency because a facility is structurally unsound and in danger of imminent collapse. Emergency

renovation/abatement means a renovation/abatement operation that was not planned but results from a sudden, unexpected event that, if not immediately attended to, presents a safety or public health hazard, is necessary to protect equipment from damage, or is necessary to avoid imposing an unreasonable financial burden. This term includes operations necessitated by non-routine failures of equipment, by actions of fire or emergency medical personnel pursuant to duties within their official capacities, or by significantly damaged friable asbestos-containing material causing an environmental health hazard (as assessed by an asbestos hazard evaluation specialist). The notification must be submitted as early as possible before, but not later than, the following working day from start of demolition or renovation/abatement activities. The notification must include the supplemental information required in Sections 9 or 10.

- "Annual" refers to planned renovation operations over a calendar year involving a series of non-scheduled operations that are collectively greater than the threshold limits; these notifications must be submitted in the month prior to the beginning of the calendar year. See separate guidance document or contact Ohio EPA Central Office to determine if the project will meet Annual notification requirements.

- "Cancellation" is submitted to indicate a project has been cancelled and work will not be completed.

- "County" is for listing the County in which the project will occur.

2. Provide owner, asbestos abatement contractor, billing, fire department Information (all that apply):

- In the "Owner" line, list the property owner [individual(s) who own(s) the property at the time of demolition/renovation (Note, this may be a government or private entity)] or list the Coordinating Entity (i.e., land bank, municipality, etc.) if the facility is part of a larger project or installation. Include address, contact person, phone, fax, and email for the listed Owner.

- Specify the name, address, contact person, phone, fax, email, and Ohio Environmental Protection Agency license number (ACXXXX) for the "Asbestos Abatement Contractor" (if regulated asbestos containing material(s) is being abated).

- Specify the billing contact for the project notification fees, either the Owner, the Asbestos Abatement Contractor, or the Demolition Contractor (if project is not an installation).

- Specify the name, address, contact person, phone, fax, email, for the "Fire Department" (if demolition of a facility is by intentional burning).

3. For any project subject to OAC 3745-20, include the Asbestos Hazard "Evaluation Specialist" Name, "Certification # (ESXXXX)", and "procedure used to detect and analyze asbestos". Analytical methods could include the collection of samples and sample analyses by polarized light microscopy (PLM) with dispersion staining. For samples that test under 10% asbestos content: An owner or operator may (a) elect to assume material to be greater than 1% asbestos, or, (b) require verification by point counting in which the point counting result will supersede the PLM estimation; Both choice and result should be stated on the notification. Explain any other method(s) used. All owners/operators should have the records of the asbestos assessment and analyses (inspection/survey report) on-site during active operations for reference and inspection. Such records would include a list of materials assessed, locations sampled and the sample results; this information can be found within the asbestos inspection report.

4. Describe the specific procedures to be followed in the event unexpected regulated asbestos-containing material (RACM) is found or non-friable asbestos-containing material becomes friable RACM.

Examples:

A. Stop work, evacuate area, and demarcate the area.

B. Wetting of ACM with amended water and using wet cleaning methods.

Should the discovery of unexpected RACM change the original amount of asbestos to be abated by 20 percent or more, you must submit a revised notification pursuant to OAC 3745-20-03. A revised notification must reflect the change in the amount of affected asbestos-containing material. The revised notification must also reflect the new asbestos removal start date, if applicable.

5. Select the appropriate box (*Implosion, Fire Training, Wet Methods, Manual Demolition, Mechanical Demolition or Other*). Underneath the check boxes, write a brief summary of the specific method to be used on this project. In the box *Description*

of affected facility components, include detailed information for each component where RACM is being removed. "Fire Training" refers to the demolition of a facility by intentional burning. All asbestos containing material, including Category I and Category II non-friable ACM, must be removed in accordance with OAC 3745-20 before burning. Additional requirements also apply; please contact the Ohio EPA District Office or Local Air Agency with jurisdiction for additional information (See attached map).

6. For the materials listed in each project, on the line for *Type of ACM to be abated*, check the appropriate box (*Surfacing, Mechanical or Other*). If "*Other"* is selected, specify what the asbestos material is. At least one box must be checked, but if multiple types of asbestos are being removed, multiple boxes may be checked. On the line for *Engineering Controls*, select the appropriate box (*Wet Methods, Glove Bag, NPE, AFD or Other*). If "*Other"* is selected, specify the method(s) to be used. At least one type of engineering control must be selected, but multiple methods may be selected. On the line for *Work Practices*, select the appropriate box (*Intact Removal, Manual, Mechanical or Other*). If "*Other"* is selected, specify what the work practice method is. At least one work practice box must be selected but more than one may be selected.

7. Please complete the information for this section if asbestos containing material is being removed. On the name line, enter the name of the transporter company (example: *Jones Waste Hauler*) and complete the other fields in accordance to the information relating to this company. If more than one transporter is being used, complete the information for the second transporter in this same manner. **NOTE: you must also complete a Waste Shipment Record prior to consigning any asbestos containing waste materials (ACWM).**

8. Enter the name of the waste disposal site and complete all the other fields based on the physical location of the site. Check the following Ohio EPA website for an updated list of approved asbestos accepting waste disposal sites: www.epa.ohio.gov/dapc/atu/asbestos.aspx

9. This section must be completed for emergency demolitions that meet the definitions and requirements of the regulation. If a facility is not in imminent danger of collapse, it is not an emergency demolition even though it may be ordered to be demolished due to hazardous conditions. Provide the name, title and agency of the state or local governmental representative who has ordered the demolition. The Authority of Order is the applicable state or local regulation under which the demolition order has been issued. **You must attach a copy of the demolition order to the notification.**

10. This section shall be completed for emergency renovations/abatement that meet criteria described in OAC 3745-20-01 and OAC 3745-22-03(H). **You must provide detail on the four items listed in this section, including a description of how the project meets the "emergency" requirements of OAC 3745-22-03(H). A separate sheet may be needed.**

11. The person signing this notification is attesting to the fact that in accordance with Ohio Administrative Code rule 3745-20-03(A)(4)(p), they are certifying that at least one person trained as required by paragraph (B) of rule 3745-20-04 of the Administrative Code will supervise the stripping and removal described by this notification, and are acknowledging that the submission of false or misleading statements is prohibited by law and certifying that facts contained in this notification are true, accurate, and complete.

Section 2: Project Address Specific Information

Please complete Section 2 for the address included with this notification. If the project is an "Installation" per OAC 3745-20, complete a separate Section 2 page for each address associated with this notification.

A. Describe the building(s) or structure(s) affected by the operations. Include building size in square feet, specific site location, number of floors, and age in years. Also include the present and prior use (i.e., industrial, commercial, institutional, residential, vacant, etc.) of the building(s).

B. Identify the type of operation. Definitions of these terms can be found in OAC 3745-20-01.

- "Demolition" means the wrecking, or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.
- "Renovation" means altering a facility or one or more facility components in any way, including the stripping or removal of regulated asbestos-containing material in an amount greater than 260 linear feet, 160 square feet, or 35 cubic feet from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.

- "Abatement" refers to any Asbestos hazard abatement activity involving the removal, renovation, enclosure, repair, or encapsulation of reasonably related friable asbestos-containing materials in an amount greater than 50 linear feet or 50 square feet. Asbestos hazard abatement activity also includes any such activity involving such asbestos-containing materials in an amount of 50 linear or 50 square feet or less if, when combined with any other reasonably related activity in terms of time and location of the activity, the total amount is in an amount greater than 50 linear or 50 square feet.

C. Declare whether or not asbestos is present in any quantity. This includes assumed asbestos containing materials such as roofing and flooring. Also specify if the facility was previously abated and year when previous asbestos abatement occurred (if applicable).

D. Specify the amount of regulated asbestos-containing material (RACM) to be removed as follows: linear feet on pipes, square feet (surface area) on facility components, and total cubic feet (volume) on or off all facility components. Asbestos containing demolition debris and related materials shall be quantified in cubic feet (volume) Convert any cubic yardage measurements to cubic feet (1 cubic yard = 27 cubic feet). Estimate the approximate amount of Category I and Category II non-friable asbestos-containing material in the affected part of the facility that will be removed before demolition. Estimate the approximate amount of Category I and Category II non-friable asbestos-containing material in good condition in the affected part of the facility that will not be removed before demolition.

E. Specify the scheduled dates for asbestos removal, the hours of operation, and the days of the week that asbestos removal operations will be active onsite. Please note, the setup date must be at least 10 working-days after postmark or hand-deliver date. Also include the name, certification number, and expiration date of the asbestos hazard abatement specialist scheduled to be onsite in charge of the asbestos abatement project. Additional boxes have been provided in the event the project involves more than one shift.

F. Specify the name, address, contact person, phone, fax, and email for the Demolition Contractor, if applicable.

G. Specify the starting and ending dates for demolition even when no asbestos-containing materials are present. Should the demolition not begin on the start date listed, a revised notification form shall be submitted prior to the listed start date. Please note the start date must be at least 10 working-days after postmark or hand-deliver date.

H. If a project is being placed on hold, specify the dates as follows:

- "Hold Begin Date" indicate date that the regularly scheduled demolition or renovation/abatement operations will be put on hold at the facility.

- "Work Resume Date" indicate date that the regularly scheduled demolition or renovation/abatement operations will resume at the facility. If a project was previously placed "On Hold", the Ohio EPA must receive notification of returning to the project at least one (1) working day prior to resuming demolition and/or renovation/abatement activities.

Be sure to indicate the correct page numbers across the bottom of the notification once all the pages are complete.

The asbestos regulations, notification forms, guidance, local contacts, and other information can be found on Ohio EPA's asbestos program web site at www.epa.ohio.gov/dapc/atu/asbestos.aspx

Notification Fee Worksheet

Division of Air Pollution Control

Work on projects cannot begin until 10 working days after a COMPLETE original notification form, **including payment**, is submitted to Ohio EPA. The form and instructions with definitions are available at epa.ohio.gov/asbestos. The form can be completed, and payment made, at ebiz.epa.ohio.gov. Questions? asbestos@epa.ohio.gov or 614-466-0061

Licensing Project Notification Fee(s):

A $65 notification licensing fee is due per project if it involves an abatement\renovation with RACM greater than 50 linear or square feet or greater than or equal to 35 cubic feet. Complete the table below with RACM amounts from each project listed in Section 2.D. of the Notification form. Place $65 in each row where this criterion is met.

Project Detail						
Project	**Demo**	**Reno**	**Linear Ft.**	**Square Ft.**	**Cubic Ft.**	**License Fee**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
		Total:				**$** **1**

Applicable NESHAP Project Notification Fees:

The NESHAP notification fees below apply if one of the following are on the completed notification form:

- The project(s) is part of an installation; or
- At least one project is a demolition; or
- At least one project is a renovation/abatement with the total RACM being greater than or equal to 260 linear feet, 160 square feet, or 35 cubic feet.

NESHAP Notification Fee	A fee of $75.	**$**	**2**
RACM Fee	A $3 fee is charged per unit of the total linear and square feet of RACM. A unit is calculated by taking that total and dividing by 50. Only whole units are charged. (a) Total linear feet + Total sq. ft = _____ (b) Total in (a) divided by 50 = _____ (c) Number in (b) rounded down to a whole unit = _____ (d) Multiply the whole unit in (c) by $3 = _____	**$**	**3**
Clean-Up Fee	A $4 fee is charged per cubic yard of RACM. Calculate this by taking the total cubic feet and dividing by 27. Only whole cubic yards are charged. (a) Total cubic feet divided by 27 = _____ (b) Number in (a) rounded down to a whole cubic yard = _____ (c) Multiply the whole cubic yard in (b) by $4 = _____	**$**	**4**
		Total Amount Due **(Add 1-4 above)**	**$**

You must include a check or money order, payable to Treasurer State of Ohio, with your project notification form for your notification to be complete.

SECTION 00 31 32 GEOTECHNICAL DATA

Preble Full-Service Maintenance Facility

Structure Foundation Exploration Report

March 3, 2025 | Terracon Project No. N1245108

Prepared for:

Burgess & Niple
525 Vine Street, Suite 600
Cincinnati, OH 45202

Terracon
Explore with us

Nationwide
Terracon.com

- Facilities
- Environmental
- Geotechnical
- Materials

611 Lunken Park Drive
Cincinnati, Ohio 45226
P (513) 321-5816
Terracon.com

March 3, 2025

Burgess & Niple
525 Vine Street, Suite 600
Cincinnati, OH 45202

Attn: Chad Kohler, A1A
P: (513) 579-0042
E: chad.kohler@burgessniple.com

Re: Structure Foundation Exploration Report
Preble Full-Service Maintenance Facility
234 Quaker Trace Road
West Alexandria, Preble County, Ohio
Terracon Project No. N1245108

Dear Mr. Kohler:

We have completed the scope of geotechnical services for the above-referenced project in general accordance with the Agreement for Subconsultant Services, dated July 9, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning for the proposed maintenance facility project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon

03/03/2025

Brent M. Langlois, P.E.
Senior Engineer

S. Taylor Taluskie, P.E.
Group Manager

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Exploration Plan
Test Boring Logs
ODOT Test Boring Terminology
ODOT Soil Classification
Grain Size Distribution Plots
Unconfined Compression Tests
Subgrade Analysis

Introduction

This report presents the results of our subsurface exploration and geotechnical services performed for the proposed maintenance facility to be located at 234 Quaker Trace Road in West Alexandria, Preble County, Ohio. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil and groundwater conditions
- Seismic site classification
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Pavement subgrade design and construction

The project includes the construction of a new maintenance facility on the site of the existing maintenance facility. The existing structures will be removed and replaced with 5 new structures. In addition, paved parking and driveways are anticipated. We understand that it has yet to be decided if the demolition will occur before or after construction of the new buildings.

A preliminary geotechnical study was performed previously (Reference: Preliminary Structure Foundation Exploration Report, dated September 13, 2024). This report provides final geotechnical recommendations based on the most recently performed field and laboratory work. Boring logs and laboratory test results from the preliminary study are included in this report as well.

The following details related to the planned structures were obtained from the Preble County Full-Service Maintenance Facility Plan Drawings by Burgess & Niple / KZF Design (BN-KZF), dated November 13, 2024.No basements are planned for any of the structures. The proposed structures will all be single-story constructed with a slab-on grade. No basements are planned.

- Admin Building: Approximately 74 feet by 115 feet; FFE = 976 ft
- Truck Storage: Approximately 120 feet by 124 feet; FFE = 976 ft
- Maintenance Garage: Approximately 82 feet by 100 feet; FFE = 976 ft
- Salt Storage: Approximately 80 feet by 120 feet; FFE = 975 ft
- Cold Storage: Approximately 125 feet by 79 feet; FFE = 974.75 ft
- Material Storage: Approximately 90 feet by 30 feet; FFE = 975.25 ft

Structure loads provided by Schaefer are summarized below:

Admin Building

- Columns: 80 kips
- Slab: 100 pounds per square foot (psf)

Truck Storage and Maintenance Garage

- Columns: 120 kips
- Slabs: 375 pounds per square foot (psf)

Salt Storage

- Slab: 2,000 psf

Cold Storage

- Walls: 2,500 lb/ft
- Slab: 375 psf

Material Storage

- Columns: 50 kips
- Slab: 2,000 psf

The site grading plan indicates grading for the site development will generally range from about 1 foot of cut to about 3 feet of fill. Excavation depths for the proposed pond will range from 1 to 5 feet with 3H:1V slopes. A stockpile will be removed from the laydown yard.

Geology and Observations

The soils in the project area consist of native glacially deposited soils. Bedrock was not encountered in our exploration.

Based on USDA Soil Survey mapping, the natural overburden soils in the project area consist of soils of the Miamian, Crosby, Celina, and Kokomo Series. These are cohesive soils found on till plains and moraines and within till plain depressions (Kokomo) of Wisconsinan age and are typically capped with wind-deposited loess.

The USGS bedrock geology indicates the project area lies within the Drakes, Whitewater and Liberty Formations which consists of Ordovician age interbedded shale and limestone. The Ohio Department of Natural Resources (ODNR) bedrock topography contours indicate the top of bedrock lies between Elevations 850 and 900 feet MSL which indicates bedrock is at greater depths than 75 feet below the existing ground surface. The maximum explored depth under this geotechnical study was 25 feet.

Exploration

The preliminary study consisted of nine (9) Standard Penetration Test (SPT) borings performed from August 7th to 9th of 2024. These borings were drilled at widely spaced locations, generally following a gridded pattern. An additional twenty (20) SPT borings were performed from January 13th to 17th of 2025 for the final exploration. These borings were laid out in structure-specific areas based on the site plan provided in the drawings. Ground surface elevations were measured with a GPS device capable of accuracy within +/- 1 foot.

The test borings were performed with a CME-55 track-mounted drill rig. The test borings were drilled to depths ranging from 10 to 50 feet below the ground surface. The drill rig utilized hollow-stem augers to permit split-spoon sampling in the overburden soils. Drilling and sampling procedures were performed in general accordance with the Ohio Department of Transportation (ODOT) Specifications for Geotechnical Explorations (SGE). The average drill rod energy ratio (ER) for the drill rig was calibrated to be 97.1 percent (calibration date 1/13/2023) for the preliminary borings. The ER was capped at 90 percent for SPT N-value energy correction as required by the ODOT SGE. The average ER for the drill rig used for the final study borings was calibrated to be 88.8 percent (calibration date 12/10/2024).

Upon completion of the drilling activities, the boreholes were backfilled with auger cuttings. Borings drilled in existing pavement areas were repaired with cold-patch asphalt.

Laboratory Testing

Selected soil samples were tested in the laboratory for Atterberg Limits, sieve/hydrometer analysis, and moisture content (index-property classification testing). Moisture content tests were performed on the remaining soil samples. Unconfined compression tests were performed on undisturbed soil samples. A hand penetrometer was used to estimate the approximate unconfined compressive strength of cohesive SPT soil samples. The hand penetrometer has been correlated with unconfined compression tests and provides a better estimate of soil consistency than visual examination alone.

Moisture content, Atterberg limits, and hand penetrometer results are provided on the boring logs. Graphs of the sieve and hydrometer analysis and unconfined compression tests are provided separately in the attachments.

Findings

The test borings were performed primarily in undeveloped areas on the north and south sides of the existing facility. There were 4 borings performed in existing paved areas. The borings performed in the green areas identified approximately 4 to 7 inches of topsoil. The borings in the existing pavements areas disclosed asphalt thicknesses ranging from 5 to 10 inches over aggregate base ranging from 4 to 7 inches thick.

Under the surface stratum, the test borings indicated the subsurface conditions across the site consists of 3 ½ to 8 ½ feet of clayey/silty overburden soils underlain by glacial till with intermittent layers of granular outwash to the maximum explored depth of 50 feet. The overburden soils were generally medium stiff to very stiff with ODOT soil classifications of sandy silt (A-4a), silt and clay (A-6a), silty clay (A-6b), and clay (A-7-6). The glacial till soils were very stiff to hard with ODOT soil classifications of sandy silt (A-4a) and silt and clay (A-6a). The outwash soils were dense to very dense with the ODOT soil classification gravel and/or stone fragments with sand and silt (A-2-4).

Water was observed in 19 of the 29 test borings. A summary of the water levels in the boreholes measured at the completion of drilling are provided in the following table.

Borings	Date	Elevation Range	Depth Range
Preliminary Study (Borings B-1 to B-9)	Performed August 2024	970 to 973 feet	3 to 9 feet
Phase 2 Study (Borings B-10 to B-29)	Performed January 2025	955 to 968 feet	5 to 19 feet

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were performed. Groundwater amongst profiles of this type typically occurs as perched condition. Perched groundwater is typically found within in glacial overburden soils overlying the very stiff to hard glacial till or in granular seams. The possibility of groundwater fluctuations should be considered when developing the design and construction plans.

Subsurface soil and groundwater conditions disclosed at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types. In situ, the transition between materials may be gradual.

Analyses and Recommendations

The following recommendations are provided to assist in the design of the proposed structures.

Seismic Site Class

The seismic design requirements for buildings and other structures are based on the Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties observed at the site and as described on the exploration logs and results, our professional opinion is that a Seismic Site Classification of D be considered for the project. Subsurface explorations at this site were extended to a maximum depth of 50 feet and did not reach bedrock. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area.

Earthwork

Earthwork on this project is anticipated to include demolition/removal of existing structures, site preparation (i.e., clearing, grubbing, topsoil stripping), subgrade compaction and proofrolling, engineered fill placement, and shallow excavations for foundations.

Borings B-17, B-21, B-23 encountered A-7-6 soils which are high in plasticity and therefore prone to shrink-swell movements with moisture changes. These soils should be undercut a minimum of 3 feet below the subgrade level of floor slabs, footings, and pavements and replaced with engineered fill. Alternatively, these soils can be chemically modified with lime.

Boring B-27 was performed in the planned pond area. The boring indicated that excavations for the pond will consist of A-6a and A-6b soil types which are generally suitable for re-use as engineered fill for structure areas.

Prior to placing any new embankment fill, all existing structures, vegetation, topsoil, existing pavement, and any otherwise unsuitable material should be removed from the construction areas. After stripping and grubbing, the subgrade should be proofrolled where possible to aid in locating loose or soft areas. Unstable areas identified by the proof roll should be stabilized by undercutting and replacing with granular fill or using cement or lime chemicals. Where grades are steeper than 8H:1V, level benches should be excavated to accept the new embankment fill. New embankment fill materials should

meet the criteria in CMS Section 203. Embankment fill should be placed and compacted per CMS Section 203.

ODOT specifications are anticipated to govern the project. In this case, Terracon does not recommend any exceptions to ODOT's Construction and Materials Specifications (CMS). Earthwork on this project should be observed and evaluated by Terracon.

Foundations

The subsurface conditions disclosed in the borings indicate the proposed structures can be supported by a shallow foundation system consisting of conventional spread footings and a concrete slab-on-grade foundation. The table below provides design parameters and estimated settlement to assist with design and cost development for the proposed structures' foundations. The design is based on American Association of State Highway and Transportation Officials (AASHTO) Load Resistance Factored Design (LRFD) Bridge Design Specifications as required by the ODOT Geotechnical Design Manual (GDM).

Item	Spread Footings for Various Structures	Salt and Materials Storage Slabs
Loads	Column: 50 to 120 kips Wall: 2,500 lb/foot	Slab: 2,000 psf
Factored Bearing Resistance [1, 2]	3,000 psf (LRFD Resistance Factor, φ_b: 0.5)	2,000 psf (LRFD Resistance Factor, φ_b: 0.5)
Bearing Soils[3]	Native at least stiff soils or engineered fill. (Soil types A-4a, A-6a, A-6b, or A-7-6).	
Foundation Dimensions	■ Minimum 30 inches for columns footings ■ Minimum 18 inches continuous/wall footings	Salt Storage: 80 ft by 120 ft Materials Storage: 90 ft by 30 ft
Factored Passive Resistance[3] (equivalent fluid pressures)	125 pcf (based on LRFD Resistance Factor of 0.5)	
Factored Sliding Resistance [4]	■ 0.25 cohesive (based on LRFD Resistance Factor, φ_T of 0.85) ■ 0.30 granular (based on LRFD Resistance Factor, φ_T of 0.8)	
Minimum Embedment below Finished Grade [5]	32 inches for frost protection	
Estimated Total Settlement	About 1 inch	2 to 3 inches

Item	Spread Footings for Various Structures	Salt and Materials Storage Slabs

1. The factored bearing resistance is the resistance in excess of the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20% within 10 feet of structure.
2. Unsuitable or soft soils should be over-excavated and replaced.
3. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Assumes no hydrostatic pressure.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations. For fine-grained materials, lateral resistance using cohesion should not exceed ½ the dead load.
5. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.

The table below provides design parameters to assist with the design for the proposed structures' floor slabs.

Item	Admin Building	Truck and Maintenance Garage, Cold Storage Buildings	Salt and Material Storage Buildings
Floor Slab Load	100 psf	375 psf	2,000 psf
Floor Slab Support[1]	Minimum 6 inches of free draining (less than 5% passing the U.S. No. 200 sieve) crushed aggregate		
Estimated Modulus of Subgrade Reaction[1]	100 pounds per square inch per inch (psi/in) for point loads	5 psi/in	14 psi/in

1. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, and the floor slab support as noted in this table. It is relevant to point loads for the admin building. A lower value is provided for the truck and maintenance garages, cold storage, and salt storage buildings which we understand will receive larger area (non-point) loads.

Pavements

The overburden soils in the borings at/near the anticipated subgrade level in the borings performed in proposed pavement areas (i.e., upper 6 feet) classify as A-2-4, A-4a, A-6a, A-6b, and A-7-6 per the ODOT Classification system. Based on laboratory testing, the existing subgrade soils have moisture contents ranging from about 11 to 31 percent,

with an average moisture content of the subgrade soils across the project area of about 17 percent. Plasticity indices in the subgrade soils ranged from about 8 to 32, with an average plasticity index of about 19.

The moisture contents in the upper 6 feet of the planned subgrade in the pavement borings ranged from approximately 4 percent below to 13 percent above the estimated optimum moisture contents (M_{OPT}) for the corresponding soil type as outlined in ODOT GDM Subgrade Analysis Section 600.

The N_{60L} values (low N-values) for the anticipated subgrade soils encountered in the test borings ranged from 9 to 27 bpf (blows per foot), with an average N_{60L} value of 15 bpf.

The subgrade analysis indicated that 4 out of the 7 borings require subgrade stabilization. We recommend subgrade stabilization be considered for construction of parking lot and driveways. Subgrade stabilization can consist of 1 of the following 2 methods:

- Undercutting and Replacement with Granular Fill – The use of granular fill to replace soft soils may be used to improve subgrade stability. The subgrade analysis indicates that the subgrade should be undercut at least 12 inches below the anticipated top of subgrade. The bottom of the excavation should be lined with a geotextile fabric (ODOT Specification Item 204) and replaced with compacted granular fill (ODOT Specification Item 204 Type B).

- Chemical Stabilization – The addition of chemical additives, properly designed for the subgrade soils, may be used to increase the subgrade stability and resistance to the environment and load-induced degradation. The chemical stabilization method for the subgrade soils found in the borings will use cement or lime depending on the soil types exposed in pavement areas during construction. Chemical stabilization should extend to a depth of 12 inches below the top of subgrade.

It should be noted that subgrade conditions are dependent on the time of the year that the construction is completed (i.e., seasonally wet/dry months). Areas where subgrade soils have deteriorated either due to trafficking or water-softening may require an additional undercut to provide a suitable surface for structural fill placement and/or stabilization methods. These areas can be identified by the proof roll.

Laboratory California Bearing Ratio (CBR) testing was not performed on the anticipated subgrade soils for this project. To provide a broader representation of the subgrade along the alignment, the provided CBR value is based on correlation to the soil index properties and, more specifically, the ODOT Group Index relationship to the CBR value. The Group Index for the subgrade soils encountered at the roadway boring locations ranged from 0 to 19. Based on ODOT's guidelines for determining CBR, we recommend an average CBR value of 5 be utilized for pavement design. The recommended CBR value assumes that the subgrade stabilization/improvement recommended in this report

is performed. Construction of the subgrade stabilization/improvement should follow current ODOT Construction & Materials Specifications (CMS).

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on

nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Attachments

Site Vicinity Map (1 page)

Exploration Plan (2 pages)

Test Boring Logs (32 pages)

ODOT Test Boring Terminology (1 page)

ODOT Classification System (1 page)

Grain Size Distribution (1 page)

Unconfined Compression Test Plots (5 pages)

Subgrade Analysis (5 pages)

Site Vicinity Map

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

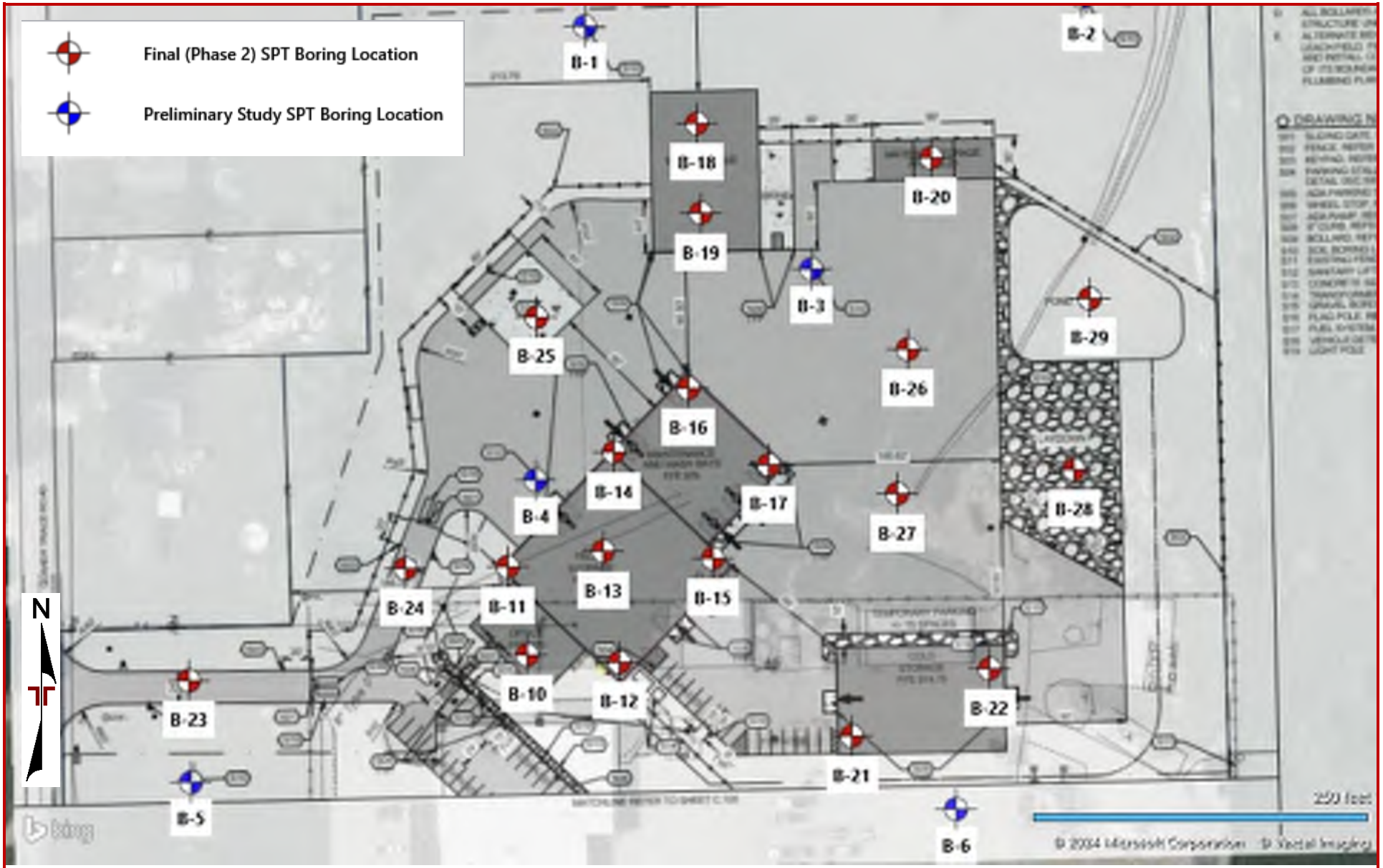

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

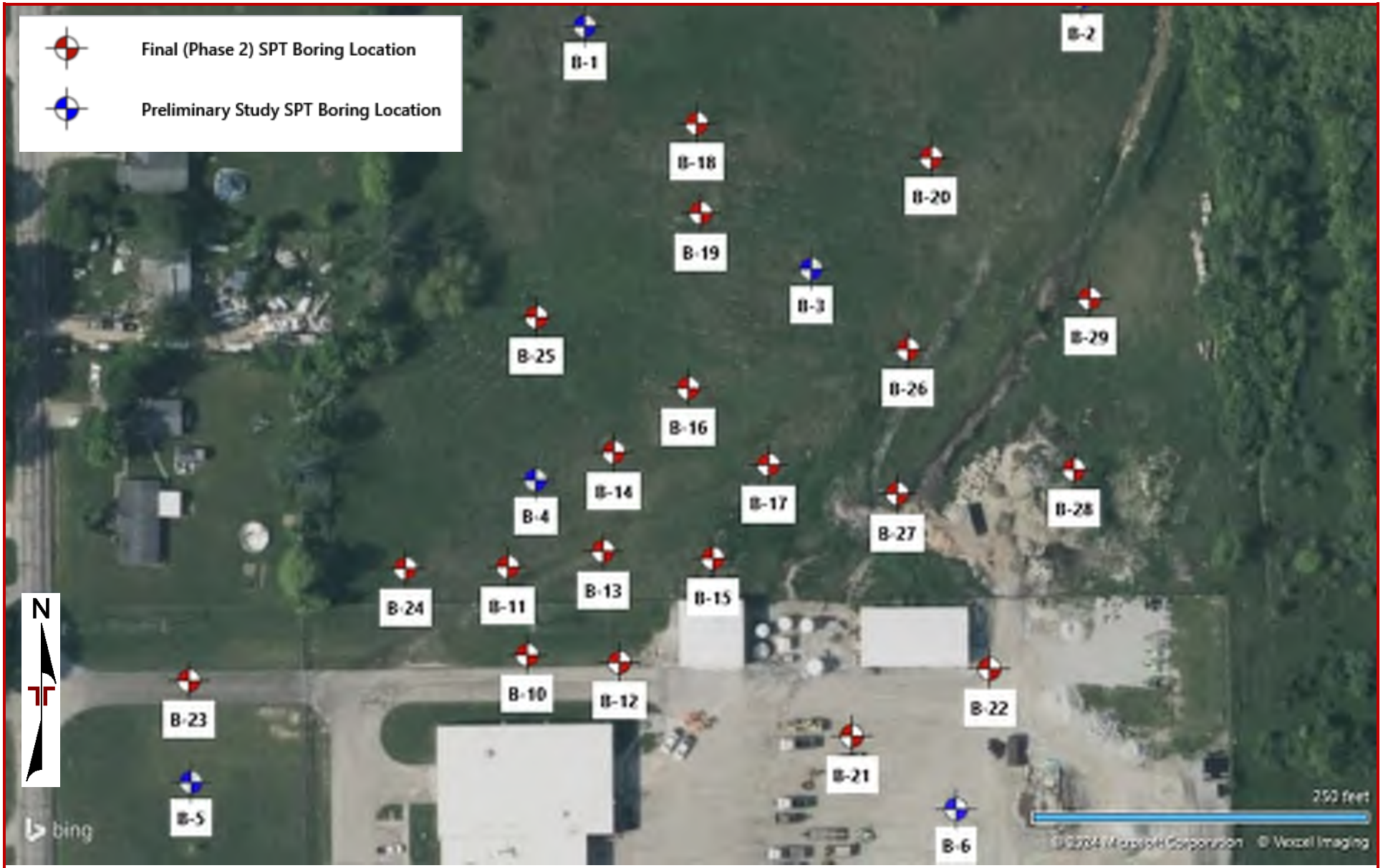

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-1
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 980.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 8/7/24 END: 8/7/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.742426, -84.574589	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	980.0 979.4																	
STIFF, BROWN, **CLAY**, TRACE SAND, TRACE GRAVEL, TRACE ROOT HAIRS, MOIST	976.5		2 3 3	9	67	SS-1	1.25	-	-	-	-	-	43	17	26	29	A-7-6 (V)	
STIFF TO VERY STIFF, BROWN TO YELLOWISH BROWN, **SILT AND CLAY**, TRACE SAND, TRACE ROCK FRAGMENTS, TRACE COBBLES, DAMP	974.0		4 5 8	20	89	SS-2	1.75	-	-	-	-	-	-	-	-	17	A-6a (V)	
STIFF TO VERY STIFF, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP	971.5		5 6 7	20	100	SS-3	1.75	-	-	-	-	-	-	-	-	12	A-6b (V)	
VERY STIFF, GRAYISH BROWN, **SILT AND CLAY**, LITTLE SAND, LITTLE GRAVEL, DAMP (GLACIAL TILL)	966.5	▽ 971.0	4 6 10	24	100	SS-4	4.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
HARD, GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP (GLACIAL TILL)	955.0	W 962.0 EOB	14 16 23	59	89	SS-5	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
			14 10 22	48	89	SS-6	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
			18 22 34	84	100	SS-7	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 19'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

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PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-2	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 970.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/7/24 END: 8/7/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.742486, -84.573273		

MATERIAL DESCRIPTION AND NOTES	ELEV. 970.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	969.4																	
MEDIUM STIFF TO STIFF, DARK BROWN, **CLAY**, LITTLE SAND, TRACE ROOT HAIRS, MOIST	966.5	1 2 3	2 2 3	8	67	SS-1	1.25	-	-	-	-	-	43	18	25	23	A-7-6 (V)	
VERY STIFF, DARK BROWN, **SILTY CLAY**, LITTLE SAND, TRACE COBBLES, TRACE ROOT HAIRS, DAMP	964.0	4 5 6 7	6 7 7	21	6	SS-2	-	-	-	-	-	-	-	-	-	0	A-6b (V)	
VERY STIFF, YELLOWISH BROWN, **SILT AND CLAY**, TRACE SAND, DAMP	961.5	8 9	4 5 5	15	100	SS-3	3.25	-	-	-	-	-	-	-	-	13	A-6a (V)	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)	956.5	10 11 12 13	13 18 17	53	89	SS-4	4.50	-	-	-	-	-	-	-	-	9	A-4a (V)	
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)		14 15 16 17 18	9 23 27	75	89	SS-5	4.50	-	-	-	-	-	-	-	-	7	A-4a (V)	
		19 20 21 22 23	21 13 20	50	100	SS-6	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	
	945.0	W 948.0 24 EOB 25	16 39 33	108	89	SS-7	-	-	-	-	-	-	-	-	-	6	A-4a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 19'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-3
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 974.0 (MSL) EOB: 24.3 ft.	PAGE 1 OF 1
START: 8/7/24 END: 8/7/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.741931, -84.573989	

MATERIAL DESCRIPTION AND NOTES	ELEV. 974.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	973.4																	
STIFF TO VERY STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP			2 4 9	20	67	SS-1	4.00	-	-	-	-	-	-	-	-	11	A-4a (V)	
		▽ 971.0			100	ST-2	-	-	-	-	-	-	21	13	8	12	A-4a (V)	
	968.0																	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP			3 3 4	11	100	SS-3	3.00	-	-	-	-	-	-	-	-	13	A-6b (V)	
	965.5																	
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, LITTLE COBBLES, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		W 965.0	2 3 9	18	89	SS-4	3.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
			13 16 15	47	100	SS-5	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	955.5																	
HARD, BROWN, **SILT AND CLAY**, SOME COBBLES, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			14 30 50/5"	-	106	SS-6	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	949.7	EOB	45 50/4"	-	100	SS-7	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 8'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

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PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-4	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 977.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/7/24 END: 8/7/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.741502, -84.574719		

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (6 INCHES)	976.5																	
STIFF TO VERY STIFF, GRAYISH BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, TRACE ROOT HAIRS, MOIST	973.5	1 2 3	2 4 5	14	67	SS-1	4.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST, DAMP	971.0	4 5 6	4 5 6	17	100	SS-2	1.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
STIFF TO VERY STIFF, GRAYISH BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	968.5	7 8	5 7 5	18	78	SS-3	1.25	-	-	-	-	-	-	-	-	12	A-6b (V)	
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP (GLACIAL TILL)	963.5	9 10 11 12 13	6 8 14	33	78	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
HARD, DARK BROWNISH GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, TRACE COBBLES, DAMP (GLACIAL TILL)	953.5	14 15 16 17 18 19 20 21 22 23	24 41 50	137	78	SS-5	4.50	-	-	-	-	-	15	12	3	7	A-4a (V)	
			11 13 19	48	89	SS-6	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)	952.0	24 25 EOB	27 32 48	120	89	SS-7	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 17'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-5	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 981.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/9/24 END: 8/9/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.740886, -84.575632		

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (4 INCHES)	981.0 / 980.7																	
VERY STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST			4 5 8	20	89	SS-1	4.00	-	-	-	-	-	21	12	9	12	A-4a (V)	
			5 5 8	20	100	SS-2	3.50	-	-	-	-	-	-	-	-	12	A-4a (V)	
	975.0																	
VERY STIFF, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP (GLACIAL TILL)			4 6 7	20	100	SS-3	2.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
	972.5																	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE COBBLES, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		▽ 972.0	3 6 5	17	100	SS-4	-	-	-	-	-	-	-	-	-	13	A-6a (V)	
			16 15 17	48	0	SS-5	-	-	-	-	-	-	-	-	-	-		
		W 965.0																
	962.5																	
HARD, BROWNISH GRAY, **SILT AND CLAY**, LITTLE SAND, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)			23 28 27	83	89	SS-6	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
	956.0	EOB	42 35 30	98	100	SS-7	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 13'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-6	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 977.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/8/24 END: 8/8/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.740832, -84.573606		

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
ASPHALT (6 INCHES)	976.5																	
AGGREGATE BASE (7 INCHES)	975.9																	
STIFF, GRAY AND YELLOWISH BROWN, **CLAY**, TRACE SAND, MOIST			3 2 4	9	56	SS-1	1.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	
		▽ 973.0	2 3 4	11	67	SS-2	1.00	-	-	-	-	-	43	16	27	26	A-7-6 (V)	
	971.0																	
VERY STIFF, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			4 5 7	18	78	SS-3	4.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
	968.5																	
STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			3 4 8	18	100	SS-4	1.75	-	-	-	-	-	-	-	-	12	A-6a (V)	
	963.5																	
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		W 961.0	8 10 13	35	89	SS-5	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	958.5																	
HARD, GRAY WITH BROWN, **SILT AND CLAY**, LITTLE SAND, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)			6 6 12	27	78	SS-6	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	952.0	EOB	17 23 31	81	89	SS-7	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 21'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-7	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 977.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/9/24 END: 8/9/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.740113, -84.575587		

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	976.4																	
MEDIUM STIFF, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE ROOT HAIRS, MOIST	974.0		1 3 2	8	33	SS-1	0.50	-	-	-	-	-	-	-	-	19	A-6b (V)	
STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, DAMP	971.0				92	ST-2	-	-	-	-	-	-	20	13	7	11	A-4a (V)	
HARD, GRAYISH BROWN, **SILT AND CLAY**, LITTLE SAND, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)	963.5		4 10 14	36	78	SS-3	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
			16 22 25	71	100	SS-4	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
HARD, GRAY, **SANDY SILT**, TRACE COBBLES, TRACE CLAY, DAMP (GLACIAL TILL)	958.5		11 13 16	44	78	SS-5	4.00	-	-	-	-	-	NP	NP	NP	12	A-4a (V)	
HARD, GRAY, **SILT AND CLAY**, SOME COBBLES, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	952.0	EOB	20 14 22	54	89	SS-6	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
			33 38 50	132	89	SS-7	4.50	-	-	-	-	-	-	-	-	7	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 21'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-8
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 976.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 8/8/24 END: 8/8/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.740317, -84.574444	

MATERIAL DESCRIPTION AND NOTES	ELEV. 976.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	975.4																	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, TRACE COBBLES, MOIST		▽ 973.0	1 2 4	9	67	SS-1	4.00	-	-	-	-	-	21	14	7	14	A-4a (V)	
			4 6 6	18	89	SS-2	4.00	-	-	-	-	-	-	-	-	14	A-4a (V)	
		W 970.0	3 5 6	17	100	SS-3	2.75	-	-	-	-	-	-	-	-	17	A-4a (V)	
	967.5																	
STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, TRACE COBBLES, DAMP (GLACIAL TILL)			3 4 5	14	100	SS-4	3.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
			5 5 5	15	0	SS-5	-	-	-	-	-	-	-	-	-	-		
	957.5																	
DENSE, GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, SOME COBBLES, DAMP (OUTWASH)			6 14 16	45	33	SS-6	-	26	30	16	18	10	-	-	-	8	A-2-4 (V)	
	952.5																	
HARD, DARK GRAY, **SANDY SILT**, LITTLE CLAY, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)	951.0	EOB	21 21 26	71	89	SS-7	4.50	-	-	-	-	-	-	-	-	7	A-4a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 8'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / KH	DRILL RIG: CME-55 DR 642	STATION / OFFSET:	EXPLORATION ID B-9	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JH	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/13/23	ELEVATION: 976.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1	
START: 8/8/24 END: 8/8/24	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 39.740272, -84.573239		

MATERIAL DESCRIPTION AND NOTES	ELEV. 976.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (7 INCHES)	975.4																	
MEDIUM STIFF TO STIFF, GRAYISH BROWN, **SILTY CLAY**, LITTLE SAND, MOIST			2 3 3	9	56	SS-1	2.00	-	-	-	-	-	-	-	-	16	A-6b (V)	
					92	ST-2	-	-	-	-	-	-	36	17	19	24	A-6b (V)	
	970.0	▽ 970.0																
STIFF TO VERY STIFF, BROWN WITH GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, DAMP			3 4 6	15	89	SS-3	1.75	-	-	-	-	-	-	-	-	13	A-6b (V)	
	967.5																	
VERY STIFF TO HARD, BROWN TO GRAYISH BROWN, **SILT AND CLAY**, LITTLE SAND, LITTLE COBBLES, TRACE GRAVEL, DAMP (GLACIAL TILL)			3 6 11	26	89	SS-4	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
			5 7 10	26	89	SS-5	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
	957.5																	
HARD, GRAYISH BROWN TO GRAY, **SILT AND CLAY**, LITTLE COBBLES, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			10 19 32	77	100	SS-6	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	951.0	EOB	19 28 31	89	89	SS-7	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 14'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-10
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 977.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/17/25 END: 1/17/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741136, -84.574737	

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	976.6																	
STIFF, BROWN AND DARK GRAY, **SILTY CLAY**, TRACE SAND, MOIST	973.5	1 2 3	2 3 4	10	100	SS-1	1.75	-	-	-	-	-	35	16	19	22	A-6b (V)	
VERY STIFF, BROWN WITH GRAY, **SILTY CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		4 5 6 7	4 6 7	19	100	SS-2	3.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
		8 9 10 11 12 13	4 4 7	16	100	SS-3	3.00	-	-	-	-	-	-	-	-	-	A-6b (V)	
			4 5 13	27	100	SS-4	4.00	-	-	-	-	-	-	-	-	11	A-6b (V)	
	963.5																	
VERY STIFF TO HARD, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)		14 15 16 17 18	8 23 22	67	100	SS-5	4.00	-	-	-	-	-	-	-	-	10	A-4a (V)	
	958.5	▽ 961.7																
HARD, GRAYISH BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	957.0	19 EOB 20	12 15 17	47	100	SS-6	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 17.3'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-11
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 977.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741318, -84.574791	

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	976.6																	
STIFF TO VERY STIFF, BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, DAMP			2 3 6	13	94	SS-1	3.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
			4 6 6	18	100	SS-2	3.50	-	-	-	-	-	-	-	-	12	A-6b (V)	
			3 5 5	15	100	SS-3	1.75	-	-	-	-	-	-	-	-	11	A-6b (V)	
	968.5																	
STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST (GLACIAL TILL)		W 967.0	7 7 15	33	83	SS-4	0.75	-	-	-	-	-	16	11	5	14	A-4a (V)	
	963.5																	
HARD, BROWNISH GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP TO MOIST (GLACIAL TILL)			9 13 13	38	83	SS-5	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
			15 19 24	64	89	SS-6	4.50	-	-	-	-	-	-	-	-	17	A-6a (V)	
	957.0	EOB																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

DRAFT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-12
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 976.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/17/25 END: 1/17/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741135, -84.574499	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	976.0																	
STIFF TO VERY STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	975.6		2 2 4	9	94	SS-1	1.25	-	-	-	-	-	-	-	-	17	A-6b (V)	
			5 6 8	21	11	SS-2	-	-	-	-	-	-	-	-	-	4	A-6b (V)	
VERY STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	970.0		4 6 6	18	100	SS-3	4.00	-	-	-	-	-	-	-	-	14	A-6b (V)	
			2 3 9	18	100	SS-4	4.50	-	-	-	-	-	-	-	-	-	A-6b (V)	
HARD, GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	962.5		15 26 28	80	100	SS-5	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
	959.4 ▽																	
	956.0	EOB	8 20 22	62	44	SS-6	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 17.6'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

DRAFT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-13
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 975.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741356, -84.574545	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	975.0																	
TOPSOIL (5 INCHES)	974.6																	
STIFF, BROWN AND DARK BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, TRACE ROOT HAIRS, DAMP	971.5		2 3 4	10	100	SS-1	2.75	-	-	-	-	-	-	-	-	24	A-6b (V)	
STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST TO DAMP	966.5		2 4 5	13	100	SS-2	1.50	-	-	-	-	-	-	-	-	17	A-4a (V)	
					79	ST-3	-	-	-	-	-	-	21	12	9	12	A-4a (V)	
HARD, GRAYISH BROWN, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE TO LITTLE GRAVEL, DAMP (GLACIAL TILL)			12 16 17	49	28	SS-4	-	-	-	-	-	-	-	-	-	10	A-6a (V)	
			10 16 12	41	100	SS-5	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	955.0	EOB	17 33 32	96	94	SS-6	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 16.7'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-14	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 974.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1	
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741561, -84.574516		

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	974.0																	
STIFF, BROWN AND DARK BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, TRACE ROOT HAIRS, MOIST	973.6	1	3 4 5	13	89	SS-1	1.50	-	-	-	-	-	-	-	-	25	A-6b (V)	
	970.5	2																
VERY STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, DAMP		3																
	968.0	4	5 5 6	16	100	SS-2	2.25	-	-	-	-	-	-	-	-	13	A-6b (V)	
VERY STIFF TO HARD, BROWN WITH GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		5																
	965.5	6	7 8 6	21	78	SS-3	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
HARD, BROWN TO GRAYISH BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		7																
		8																
		9	13 17 22	58	100	SS-4	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
		10																
		11																
		12																
		13																
		14	14 17 21	56	100	SS-5	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
		15																
		16																
		17																
	955.5	18	W 955.5															
VERY DENSE, GRAY, **COARSE AND FINE SAND**, TRACE TO LITTLE SILT, TRACE TO LITTLE GRAVEL, MOIST (GLACIAL TILL)		19	18 28 33	90	83	SS-6	-	-	-	-	-	-	-	-	-	-	A-3a (V)	
	954.0	EOB 20																

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

DRAFT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-15	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 975.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1	
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741358, -84.574261		

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	974.6																	
STIFF, BROWN AND DARK GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, DAMP	971.5		2 3 4	10	100	SS-1	1.50	-	-	-	-	-	-	-	-	32	A-6b (V)	
MEDIUM STIFF, BROWN AND GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	969.0		2 2 4	9	100	SS-2	0.50	-	-	-	-	-	31	16	15	24	A-6a (V)	
MEDIUM STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST (GLACIAL TILL)	966.5		1 2 4	9	100	SS-3	0.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
VERY STIFF TO HARD, BROWN TO GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE TO LITTLE GRAVEL, DAMP (GLACIAL TILL)			4 7 11	27	100	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
			10 16 15	46	100	SS-5	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	955.0	EOB	4 5 6	16	100	SS-6	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 15.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-16
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 973.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741684, -84.574315	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	973.0																	
	972.6																	
MEDIUM STIFF TO STIFF, DARK GRAY, **SILTY CLAY**, TRACE SAND, MOIST		1	2															
		2	2 3	7	89	SS-1	1.50	-	-	-	-	-	-	-	-	27	A-6b (V)	
	969.5	3																
MEDIUM STIFF TO STIFF, BROWN WITH GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST TO DAMP		4	2 3 8	16	89	SS-2	2.00	-	-	-	-	-	-	-	-	24	A-6b (V)	
		5																
		6	2															
		7	2 3	7	89	SS-3	2.50	-	-	-	-	-	-	-	-	13	A-6b (V)	
	964.5	8																
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		9	7 10 13	34	100	SS-4	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	959.5	10																
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST TO DAMP (GLACIAL TILL)		11																
		12	12 13 12	37	100	SS-5	4.50	-	-	-	-	-	25	15	10	16	A-4a (V)	
		13																
		14																
		15																
		16																
		17																
		18																
		19	6 10 18	41	100	SS-6	4.50	-	-	-	-	-	-	-	-	-	A-4a (V)	
	953.0	20	EOB															

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 16.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-17
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 972.0 (MSL) EOB: 20.0 ft.	PAGE 1 OF 1
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741531, -84.574102	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	972.0																	
	971.6																	
MEDIUM DENSE, GRAY, **CLAY**, LITTLE SILT, TRACE SAND, TRACE ROOT HAIRS, MOIST		1 2 3 4	1 3 4	10	83	SS-1	0.75	-	-	-	-	-	67	29	38	33	A-7-6 (V)	
	968.5																	
STIFF, BROWN AND GRAY, **CLAY**, LITTLE SILT, TRACE SAND, MOIST		4 5 6 7	4 5 6	16	83	SS-2	1.75	-	-	-	-	-	-	-	-	31	A-7-6 (V)	
	966.0																	
STIFF, BROWN WITH GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, DAMP		8 9 10 11 12 13	3 4 4	12	100	SS-3	1.25	-	-	-	-	-	-	-	-	14	A-6b (V)	
	963.5																	
VERY STIFF TO HARD, BROWN TO GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		14 15 16 17 18 19 20	4 6 8	21	100	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
			6 10 9	28	44	SS-5	3.75	-	-	-	-	-	-	-	-	10	A-6a (V)	
		▽ 954.7																
			15 14 13	40	100	SS-6	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
	952.0	EOB																

NOTES: CAVE-IN NOTED AT A DEPTH OF 18.3'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

DRAFT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-18	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 976.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 2	
START: 1/13/25 END: 1/13/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.742232, -84.574290		

MATERIAL DESCRIPTION AND NOTES	ELEV. 976.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	975.6																	
STIFF, LIGHT BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE ROOT HAIRS, MOIST	972.5		2 3 4	10	83	SS-1	1.25	-	-	-	-	-	-	-	-	20	A-6b (V)	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP			4 5 8	19	100	SS-2	4.25	-	-	-	-	-	-	-	-	13	A-4a (V)	
			5 4 4	12	100	SS-3	1.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
		W 966.0	3 4 4	12	100	SS-4	1.00	-	-	-	-	-	-	-	-	-	A-4a (V)	
	962.5				17	ST-5	-	-	-	-	-	-	18	12	6	14	A-4a (V)	
HARD, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			11 19 29	71	89	SS-6	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
VERY DENSE, GRAY, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, MOIST (OUTWASH)	957.5		49 50/4"	-	100	SS-7	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
	952.5																	
HARD, GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		▽ 950.0	46 50/5"	-	100	SS-8	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
			37 50/5"	-	100	SS-9	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PID:	SFN:	PROJECT: MAINTENANCE FACILITY	STATION / OFFSET:	START: 1/13/25	END: 1/13/25	PG 2 OF 2	B-18

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
HARD, GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL) *(continued)*	946.0	31 32 33 34 35 36 37 38	22 37 50/5"	-	100	SS-10	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
HARD, GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	937.5	39 40 41 42 43	16 23 45	101	100	SS-11	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
		44 45 46 47 48	12 16 22	56	100	SS-12	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
	926.0	EOB 49 50	18 20 19	58	56	SS-13	4.00	-	-	-	-	-	-	-	-	-	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 43'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-19	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 975.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 2	
START: 1/14/25 END: 1/14/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.742045, -84.574281		

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	974.6																	
STIFF, BROWN AND GRAYISH BROWN, **SILTY CLAY**, TRACE SAND, TRACE ROOT HAIRS, DAMP	971.5		2 3 4	10	83	SS-1	1.75	-	-	-	-	-	-	-	-	21	A-6b (V)	
VERY STIFF, BROWN WITH GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)			4 5 6	16	100	SS-2	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	
			11 27 8	52	83	SS-3	2.50	-	-	-	-	-	-	-	-	-	A-4a (V)	
					42	ST-4	-	-	-	-	-	-	18	12	6	12	A-4a (V)	
HARD, GRAYISH BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)	961.5		20 22 23	67	100	SS-5	4.50	-	-	-	-	-	-	-	-	8	A-4a (V)	
HARD, GRAY WITH BROWN, **SILT AND CLAY**, TRACE TO LITTLE GRAVEL, TRACE SAND, DAMP (GLACIAL TILL)	956.5	W 956.5	27 12 14	38	0	SS-6	-	-	-	-	-	-	-	-	-	-		
		▽ 948.0	34 34 36	104	17	SS-7	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
	946.5		10 14 16	44	100	SS-8	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:13 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PID:	SFN:	PROJECT: MAINTENANCE FACILITY	STATION / OFFSET:	START: 1/14/25	END: 1/14/25	PG 2 OF 2	B-19

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
VERY STIFF TO HARD, DARK GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL) *(continued)*	945.0	31																
		32																
		33																
		34	5 8 11	28	100	SS-9	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
		35																
		36																
		37																
		38																
		39	7 10 13	34	100	SS-10	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
		40																
		41																
		42																
		43																
		44	7 10 13	34	100	SS-11	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
		45																
		46																
		47																
		48																
		49	6 10 13	34	100	SS-12	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
	925.0	EOB 50																

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 43'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-20
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 972.0 (MSL) EOB: 50.0 ft.	PAGE 1 OF 2
START: 1/14/25 END: 1/14/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.742161, -84.573675	

MATERIAL DESCRIPTION AND NOTES	ELEV. 972.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	971.6																	
STIFF, BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, TRACE ROOT HAIRS, DAMP TO MOIST			3 4 4	12	83	SS-1	1.00	-	-	-	-	-	-	-	-	21	A-6b (V)	
			4 5 6	16	100	SS-2	1.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
	966.0																	
STIFF, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP			3 4 5	13	100	SS-3	1.00	-	-	-	-	-	-	-	-	13	A-6a (V)	
	963.5																	
DENSE, BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, TRACE MINERAL OXIDE CONCRETIONS, MOIST (OUTWASH)			3 10 11	31	89	SS-4	-	-	-	-	-	-	NP	NP	NP	20	A-2-4 (V)	
		W 957.7	14 14 17	46	100	SS-5	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	
	953.5																	
HARD, GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			9 12 13	37	89	SS-6	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	
	948.5																	
VERY STIFF TO HARD, GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			13 16 17	49	89	SS-7	-	-	-	-	-	-	-	-	-	11	A-6a (V)	
	943.5																	
VERY STIFF TO HARD, GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)			10 11 11	33	83	SS-8	3.50	-	-	-	-	-	-	-	-	10	A-6a (V)	

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PID:	SFN:	PROJECT: MAINTENANCE FACILITY	STATION / OFFSET:	START: 1/14/25	END: 1/14/25	PG 2 OF 2	B-20

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
VERY STIFF TO HARD, GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL) *(continued)*	942.0	31																
		32																
		33																
		34	8 12 17	43	100	SS-9	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
		35																
		36																
		37																
		38																
		39	9 14 20	50	100	SS-10	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
		40																
		41																
		42																
		43																
		44	12 15 21	53	100	SS-11	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
		45																
		46																
		47																
		48																
		49	11 22 27	73	100	SS-12	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
	922.0	50 EOB																

DRAFT

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-21
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 976.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/17/25 END: 1/17/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.740983, -84.573886	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
ASPHALT (10 INCHES)	976.0 / 975.2																	
AGGREGATE BASE (4 INCHES)	974.8																	
STIFF, BROWNISH GRAY, **CLAY**, LITTLE SILT, TRACE SAND, MOIST	972.5	1–3	3 3 4	10	100	SS-1	2.50	-	-	-	-	-	46	15	31	23	A-7-6 (V)	
STIFF TO VERY STIFF, BROWN, **SILTY CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP	967.5	4–7	4 6 7	19	100	SS-2	4.50	-	-	-	-	-	-	-	-	11	A-6b (V)	
		6–8	4 4 5	13	100	SS-3	1.50	-	-	-	-	-	-	-	-	-	A-6b (V)	
STIFF TO VERY STIFF, BROWN TO GRAYISH BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		9–11	3 10 9	28	100	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
		14–16	15 19 28	70	100	SS-5	4.50	-	-	-	-	-	-	-	-	-	A-6a (V)	
	956.5 ▽	19–21	18 18 13	46	100	SS-6	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	
	951.0	EOB 24–25	26 23 24	70	100	SS-7	4.50	-	-	-	-	-	-	-	-	8	A-6a (V)	

NOTES: CAVE-IN NOTED AT A DEPTH OF 21'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-22
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 975.0 (MSL) EOB: 25.0 ft.	PAGE 1 OF 1
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741104, -84.573550	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
ASPHALT (6 INCHES)	975.0																	
AGGREGATE BASE (6 INCHES)	974.5																	
STIFF, BROWN AND GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST	974.0		11 4 4	12	67	SS-1	2.75	-		-	-	-	23	13	10	15	A-4a (V)	
STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP	971.5		3 5 6	16	100	SS-2	3.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
			3 4 4	12	100	SS-3	1.25	-	-	-	-	-	-	-	-	14	A-6a (V)	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	966.5		2 4 8	18	100	SS-4	4.00	-	-	-	-	-	-	-	-	-	A-6a (V)	
HARD, DARK BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP (GLACIAL TILL)	961.5		11 20 22	62	100	SS-5	4.50	-	-	-	-	-	17	11	6	8	A-4a (V)	
			11 22 27	73	78	SS-6	3.00	-	-	-	-	-	-	-	-	-	A-4a (V)	
HARD, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	951.5		17 24 24	71	94	SS-7	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	
	950.0	EOB																

NOTES: CAVE-IN NOTED AT A DEPTH OF 19.6'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-23
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 980.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/13/25 END: 1/13/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741102, -84.575635	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
ASPHALT (5 INCHES)	980.0 / 979.6																	
AGGREGATE BASE (7 INCHES)	979.0																	
STIFF, BROWN AND GRAY, **CLAY**, LITTLE SILT, TRACE SAND, TRACE GRAVEL, MOIST		1	5	16	56	SS-1	1.50	-	-	-	-	-	54	22	32	25	A-7-6 (V)	
		2	6															
		3																
		4	3	15	44	SS-2	2.00	-	-	-	-	-	-	-	-	27	A-7-6 (V)	
		5	5															
	974.0																	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)		6	3	18	100	SS-3	3.00	-	-	-	-	-	-	-	-	12	A-6a (V)	
		7	5															
		8																
		9	5	18	17	SS-4	4.50	-	-	-	-	-	-	-	-	4	A-6a (V)	
	970.0	EOB 10	6															

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 1'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-24
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 979.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741305, -84.575075	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	979.0 / 978.6																	
STIFF, BROWN, **SILTY CLAY**, TRACE SAND, TRACE ROOT HAIRS, MOIST		1	1 3 3	9	100	SS-1	2.25	-	-	-	-	-	-	-	-	25	A-6b (V)	
	975.5	2 3 4																
VERY STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, DAMP		5	6 4 8	18	100	SS-2	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	
		6 7	4 6 6	18	100	SS-3	2.00	-	-	-	-	-	-	-	-	15	A-6b (V)	
	970.5	8																
STIFF, BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	969.0	9	2 3 5	12	100	SS-4	2.00	-	-	-	-	-	-	-	-	12	A-6b (V)	
		EOB 10																

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 6.4'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-25
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 975.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741834, -84.574718	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	975.0																	
TOPSOIL (5 INCHES)	974.6																	
STIFF, DARK GRAY, **CLAY**, LITTLE SILT, TRACE SAND, TRACE ROOT HAIRS, MOIST	971.5	1	3 3 5	12	100	SS-1	1.25	-	-	-	-	-	-	-	-	31	A-7-6 (V)	
VERY STIFF, BROWN AND GRAY, **SILTY CLAY**, LITTLE SAND, MOIST	969.0	4	2 3 6	13	100	SS-2	4.25	-	-	-	-	-	-	-	-	18	A-6b (V)	
SOFT TO MEDIUM STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	966.0	▽ 968.0 7	3 4 3	10	100	SS-3	0.25	-	-	-	-	-	31	15	16	25	A-6b (V)	
VERY STIFF, GRAY AND BROWN, **CLAY**, AND SAND, TRACE SILT, TRACE GRAVEL, WET	965.0	W 966.0 9 EOB 10	2 7 12	28	83	SS-4	0.25	-	-	-	-	-	-	-	-	44	A-7-6 (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 6.4'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-26
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 972.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/15/25 END: 1/15/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741767, -84.573740	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
	972.0																	
TOPSOIL (5 INCHES)	971.6																	
STIFF, BROWN AND GRAY, **CLAY**, LITTLE SILT, TRACE SAND, TRACE ROOT HAIRS, MOIST	968.5	1	3 5 6	16	100	SS-1	1.50	-	-	-	-	-	-	-	-	25	A-7-6 (V)	
VERY STIFF TO HARD, BROWN TO GRAY, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP		2																
		3																
		4	3 4 6	15	100	SS-2	2.25	-	-	-	-	-	-	-	-	13	A-6a (V)	
		5																
		6																
		7	5 8 10	27	100	SS-3	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
		8																
		9	10 14 14	41	100	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6a (V)	
	962.0	EOB 10																

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 7.4'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-27
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 971.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741469, -84.573793	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	971.0 970.6																	
MEDIUM DENSE, GRAY AND DARK BROWN, **GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, MOIST	967.5	1 2 3	4 10 8	27	100	SS-1	-	57	22	7	10	4	-	-	-	18	A-2-4 (V)	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP TO MOIST (GLACIAL TILL)	962.5	4 5 6	3 5 5	15	100	SS-2	2.25	-	-	-	-	-	-	-	-	12	A-6a (V)	
HARD, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP (GLACIAL TILL)	961.0	7 8 9	9 6 6	18	67	SS-3	1.75	-	-	-	-	-	-	-	-	14	A-6a (V)	
	EOB	10	8 10 11	31	78	SS-4	4.50	-	-	-	-	-	-	-	-	9	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 6.8'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-28
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:	
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 972.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741523, -84.573291	

MATERIAL DESCRIPTION AND NOTES	ELEV. 972.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	971.6																	
STIFF TO VERY STIFF, GRAYISH BROWN, **CLAY**, SOME SAND, LITTLE SILT, MOIST		W 970.0	3 3 10	19	94	SS-1	1.50	-	-	-	-	-	-	-	-	27	A-7-6 (V)	
	968.5																	
STIFF TO VERY STIFF, BROWN WITH GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST			2 3 4	10	100	SS-2	2.00	-	-	-	-	-	28	14	14	17	A-6a (V)	
			3 4 5	13	100	SS-3	1.00	-	-	-	-	-	-	-	-	16	A-6a (V)	
	962.0	EOB	2 3 7	15	100	SS-4	2.50	-	-	-	-	-	-	-	-	14	A-6a (V)	

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 7.5'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 3/3/25 16:14 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECT

PROJECT: MAINTENANCE FACILITY	DRILLING FIRM / OPERATOR: TERRACON / CK	DRILL RIG: CME-55 DR 595	STATION / OFFSET:	EXPLORATION ID B-29	
TYPE: BUILDING	SAMPLING FIRM / LOGGER: TERRACON / JF	HAMMER: CME AUTOMATIC	ALIGNMENT:		
PID: SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/10/24	ELEVATION: 970.0 (MSL) EOB: 10.0 ft.	PAGE 1 OF 1	
START: 1/16/25 END: 1/16/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.8	LAT / LONG: 39.741868, -84.573250		

MATERIAL DESCRIPTION AND NOTES	ELEV. 970.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
TOPSOIL (5 INCHES)	969.6																	
STIFF, BROWN AND GRAY, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	966.5	1	3 4 4	12	83	SS-1	2.00	-	-	-	-	-	-	-	-	23	A-6b (V)	
VERY STIFF, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	964.0	▽ 965.3 2 3 4	3 4 5	13	78	SS-2	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, MOIST (GLACIAL TILL)	960.0	W 963.0 5 6 7	3 6 3	13	100	SS-3	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	
		8 9	4 7 7	21	100	SS-4	2.75	-	-	-	-	-	-	-	-	13	A-6a (V)	
		EOB 10																

DRAFT

NOTES: CAVE-IN NOTED AT A DEPTH OF 6.7'

ABANDONMENT METHODS, MATERIALS, QUANTITIES: BACKFILLED WITH AUGER CUTTINGS

APPENDIX A.1 - ODOT Quick Reference for Visual Description of Soils

1) Strength of Soil:

Non-Cohesive (granular) Soils - Compactness	
Description	**Blows Per Ft.**
Very Loose	≤ 4
Loose	5 – 10
Medium Dense	11 – 30
Dense	31 – 50
Very Dense	> 50

2) Color:

If a color is a uniform color throughout, the term is single, modified by an adjective such as light or dark. If the predominate color is shaded by a secondary color, the secondary color procedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled"

3) Primary Component

Use **DESCRIPTION** from ODOT Soil Classification Chart on Back

Cohesive (fine grained) Soils - Consistency

Description	Qu (TSF)	Blows Per Ft.	Hand Manipulation
Very Soft	<0.25	<2	Easily penetrates 2" by fist
Soft	0.25-0.5	2 - 4	Easily penetrates 2" by thumb
Medium Stiff	0.5-1.0	5 - 8	Penetrates by thumb with moderate effort
Stiff	1.0-2.0	9 - 15	Readily indents by thumb, but not penetrate
Very Stiff	2.0-4.0	16 - 30	Readily indents by thumbnail
Hard	>4.0	>30	Indent with difficulty by thumbnail

4) Component Modifiers:

Description	Percentage By Weight
Trace	0% - 10%
Little	10% - 20%
Some	20% - 35%
"And"	35% -50%

5) Soil Organic Content

Description	% by Weight
Slightly Organic	2% - 4%
Moderately Organic	4% - 10%
Highly Organic	> 10%

6) Relative Visual Moisture

Description	Criteria	
	Cohesive Soil	Non-cohesive Soils
Dry	Powdery; Cannot be rolled; Water content well below the plastic limit	No moisture present
Damp	Leaves very little moisture when pressed between fingers; Crumbles at or before rolled to $^1/_8$"; Water content below plastic limit	Internal moisture, but no to little surface moisture
Moist	Leaves small amounts of moisture when pressed between fingers; Rolled to $^1/_8$" or smaller before crumbling; Water content above plastic limit to -3% of the liquid limit	Free water on surface, moist (shiny) appearance
Wet	Very mushy; Rolled multiple times to $^1/_8$" or smaller before crumbles; Near or above the liquid limit	Voids filled with free water, can be poured from split spoon.

CLASSIFICATION OF SOILS

Ohio Department of Transportation

(The classification of a soil is found by proceeding from top to bottom of the chart. The first classification that the test data fits is the correct classification.)

SYMBOL	DESCRIPTION	Classifcation AASHTO	Classifcation OHIO	LL_0/LL x 100*	% Pass #40	% Pass #200	Liquid Limit (LL)	Plastic Index (PI)	Group Index Max.	REMARKS
	Gravel and/or Stone Fragments	A-1-a			30 Max.	15 Max.		6 Max.	0	Min. of 50% combined gravel, cobble and boulder sizes
	Gravel and/or Stone Fragments with Sand	A-1-b			50 Max.	25 Max.		6 Max.	0	
F S	Fine Sand	A-3			51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	--	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4				35 Max.	40 Max.	10 Max.	0	
		A-2-5					41 Min.			
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6				35 Max.	40 Max.	11 Min.	4	
		A-2-7					41 Min.			
	Sandy Silt	A-4	A-4a	76 Min.		36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b	76 Min.		50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay	A-5		76 Min.		36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a	76 Min.		36 Min.	40 Max.	11 - 15	10	
	Silty Clay	A-6	A-6b	76 Min.		36 Min.	40 Max.	16 Min.	16	
	Elastic Clay	A-7-5		76 Min.		36 Min.	41 Min.	≤LL-30	20	
	Clay	A-7-6		76 Min.		36 Min.	41 Min.	>LL-30	20	
	Organic Silt	A-8	A-8a	75 Max.		36 Min.				W/o organics would classify as A-4a or A-4b
	Organic Clay	A-8	A-8b	75 Max.		36 Min.				W/o organics would classify as A-5, A-6a, A-6b, A-7-5 or A-7-6

MATERIAL CLASSIFIED BY VISUAL INSPECTION

- Sod and Topsoil
- Pavement or Base
- Uncontrolled Fill (Describe)
- Bouldery Zone
- Peat, S-Sedimentary W-Woody F-Fibrous L-Loamy & etc

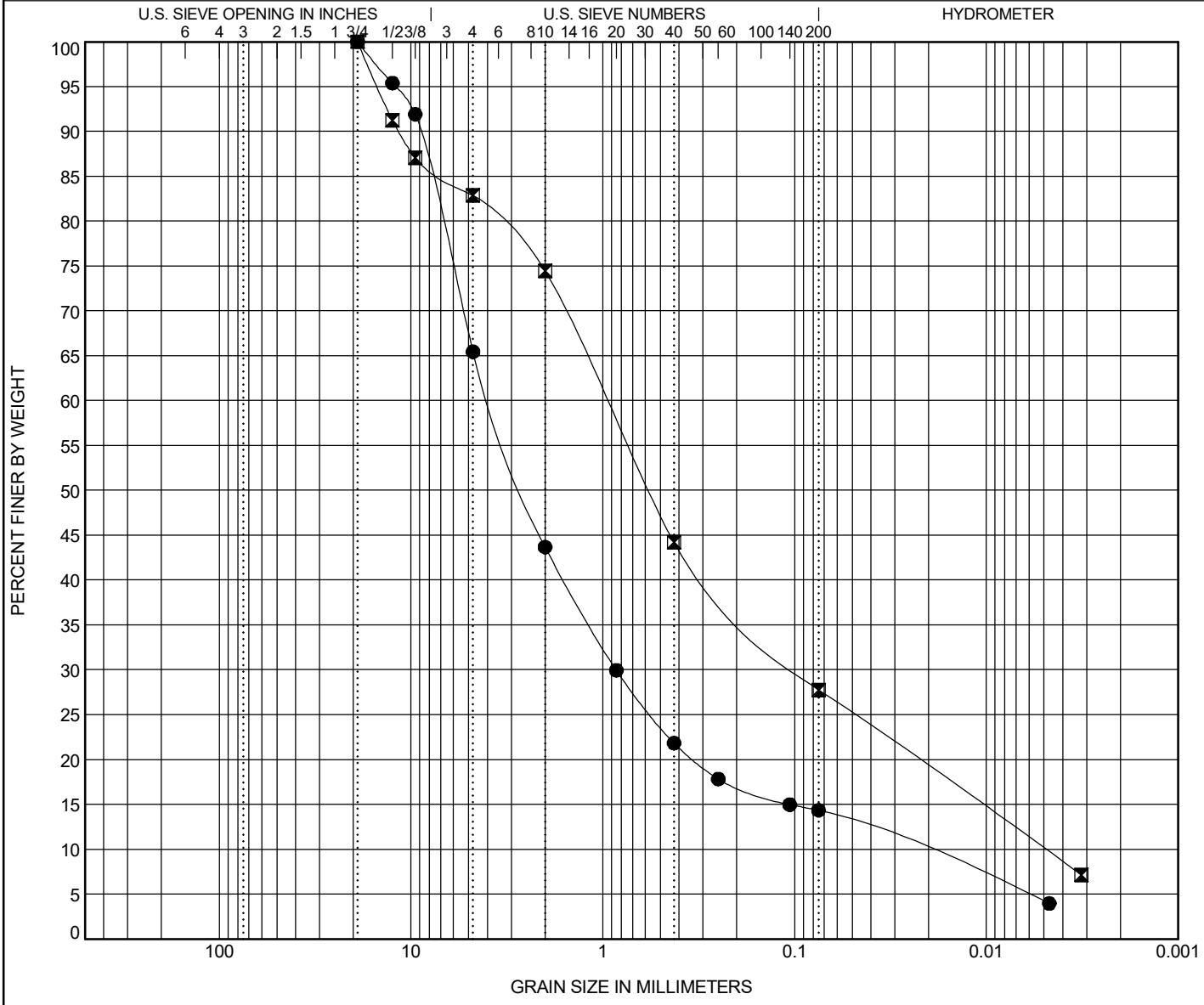
* Only perform the oven-dried liquid limit test and this calculation if organic material is present in the sample.

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MAINTENANCE FACILITY **PID**

OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	**B-27**	**1.0**	**GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT (A-2-4)**			
⊠	**B-8**	**18.5**	**GRAVEL AND/OR STONE FRAGMENTS WITH SAND AND SILT (A-2-4)**			

	Specimen Identification		D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	**B-27**	**1.0**	**9.035**	**2.572**	**0.853**	**0.024**	**57**	**22**	**7**	**10**	**4**	**8.06**	**162.06**
⊠	**B-8**	**18.5**	**11.519**	**0.572**	**0.095**	**0.005**	**26**	**30**	**16**	**18**	**10**	**1.91**	**192.65**

GRAIN SIZE - OH DOT.GDT - 2/27/25 18:16 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECTS\2024\N1245108 - PREBLE CO MAINTENANCE FACILITY\FIELD-LAB\N1245108 ODOT- PREBLE.GPJ

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 9/11/24 22:18 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECTS\2024\N1245108 - PREBLE CO MAINTENANCE FACILITY\FIELD-LAB\N1245108

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

UNCONFINED COMPRESSION TEST
AASHTO T - 208

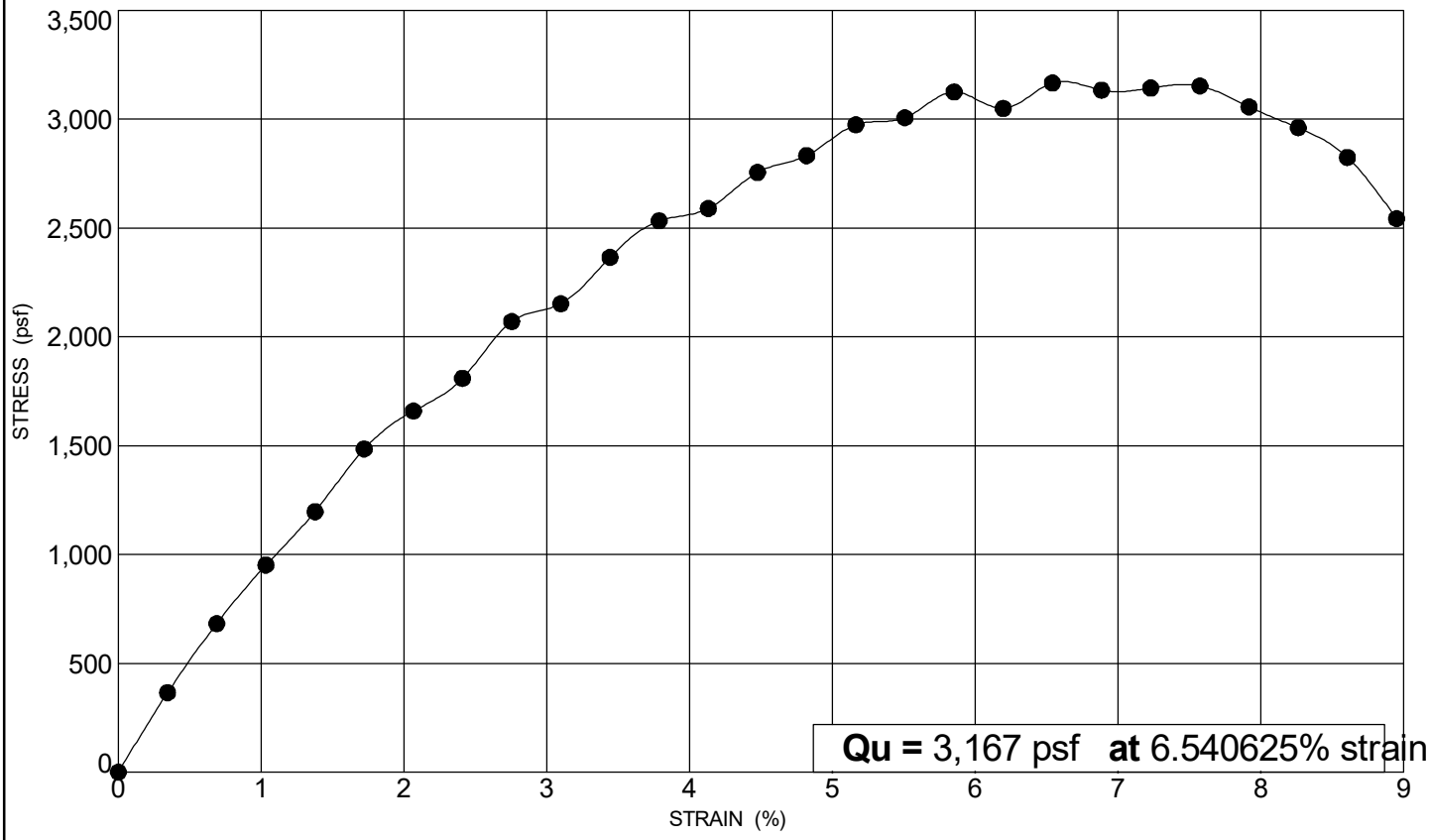
PROJECT MAINTENANCE FACILITY **PID**

OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION

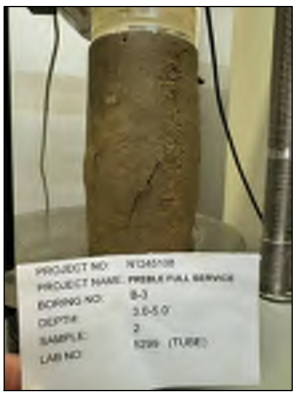
SAMPLE IDENTIFICATION

BORING ID: B-3 SAMPLE ID: ST-ST-2

STATION: NOT RECORDED DEPTH: 3.0 - 5.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS



FRONT VIEW SIDE VIEW

SPECIMEN DETAILS

HEIGHT: 5.81 inches

DIAMETER: 2.83 inches

WET UNIT WT: 148.84 pcf

DRY UNIT WT: 133.64 pcf

TESTED BY: CS 8/29/2024

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
-	-	-	-	-

ATTERBERG LIMITS			MOISTURE
LL	PL	PI	WC
21	13	8	12

ODOT CLASS: HP (tsf): -

DESCRIPTION:

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 9/11/24 22:18 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECTS\2024\N1245108 - PREBLE CO MAINTENANCE FACILITY\FIELD-LAB\N1245108

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

UNCONFINED COMPRESSION TEST
AASHTO T - 208

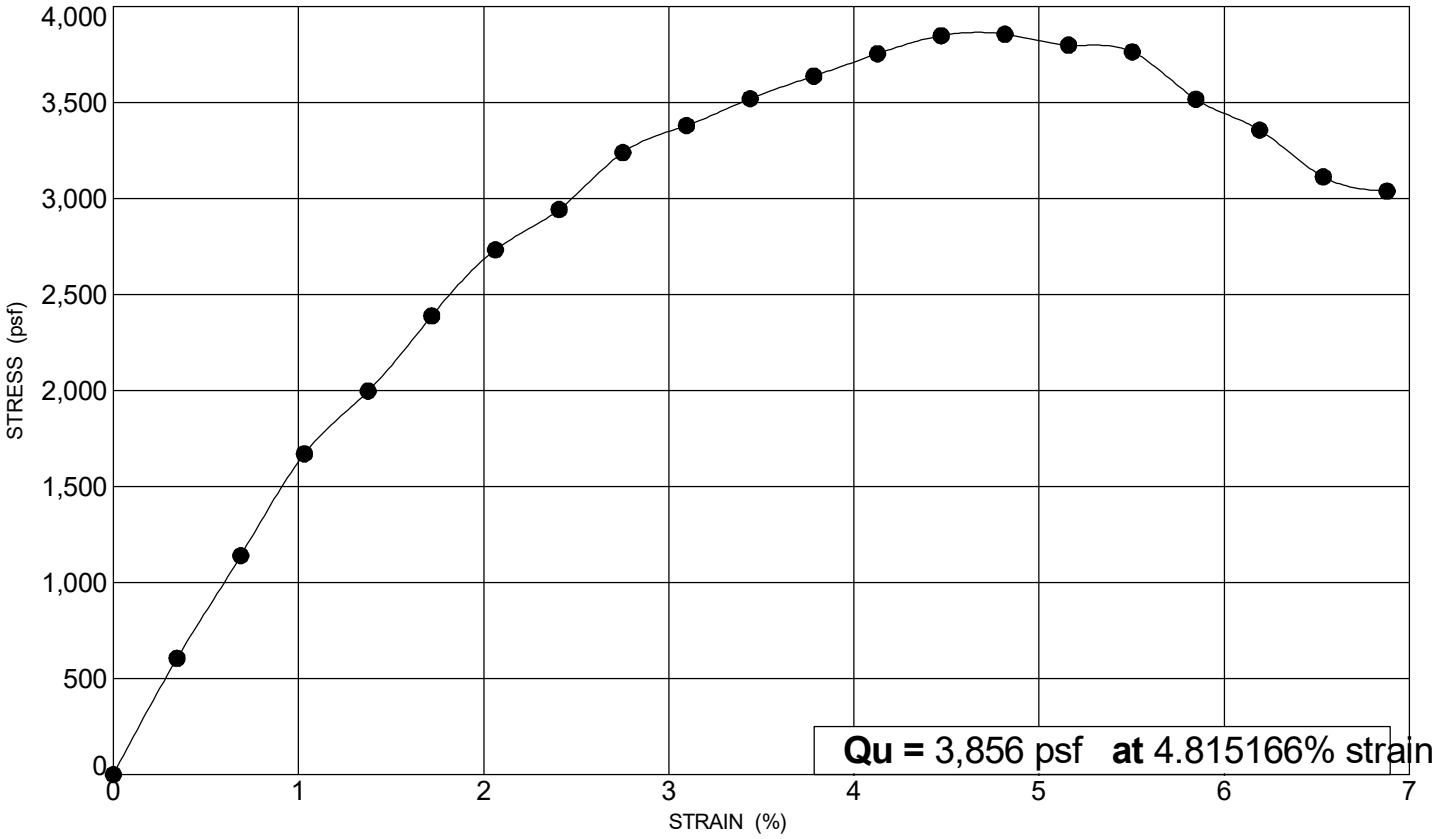
PROJECT MAINTENANCE FACILITY **PID**

OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION

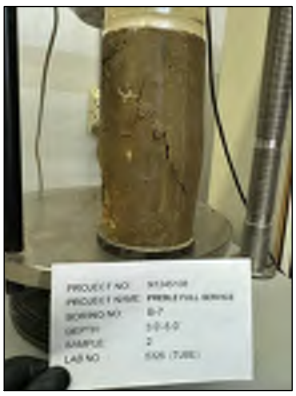
SAMPLE IDENTIFICATION

BORING ID: B-7 SAMPLE ID: ST-ST-2

STATION: NOT RECORDED DEPTH: 3.0 - 5.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS



FRONT VIEW SIDE VIEW

SPECIMEN DETAILS

HEIGHT: 5.81 inches

DIAMETER: 2.85 inches

WET UNIT WT:

DRY UNIT WT:

TESTED BY: CS 8/29/2024

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
-	-	-	-	-

ATTERBERG LIMITS MOISTURE

LL	PL	PI	WC
20	13	7	11

ODOT CLASS: HP (tsf): -

DESCRIPTION:

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UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

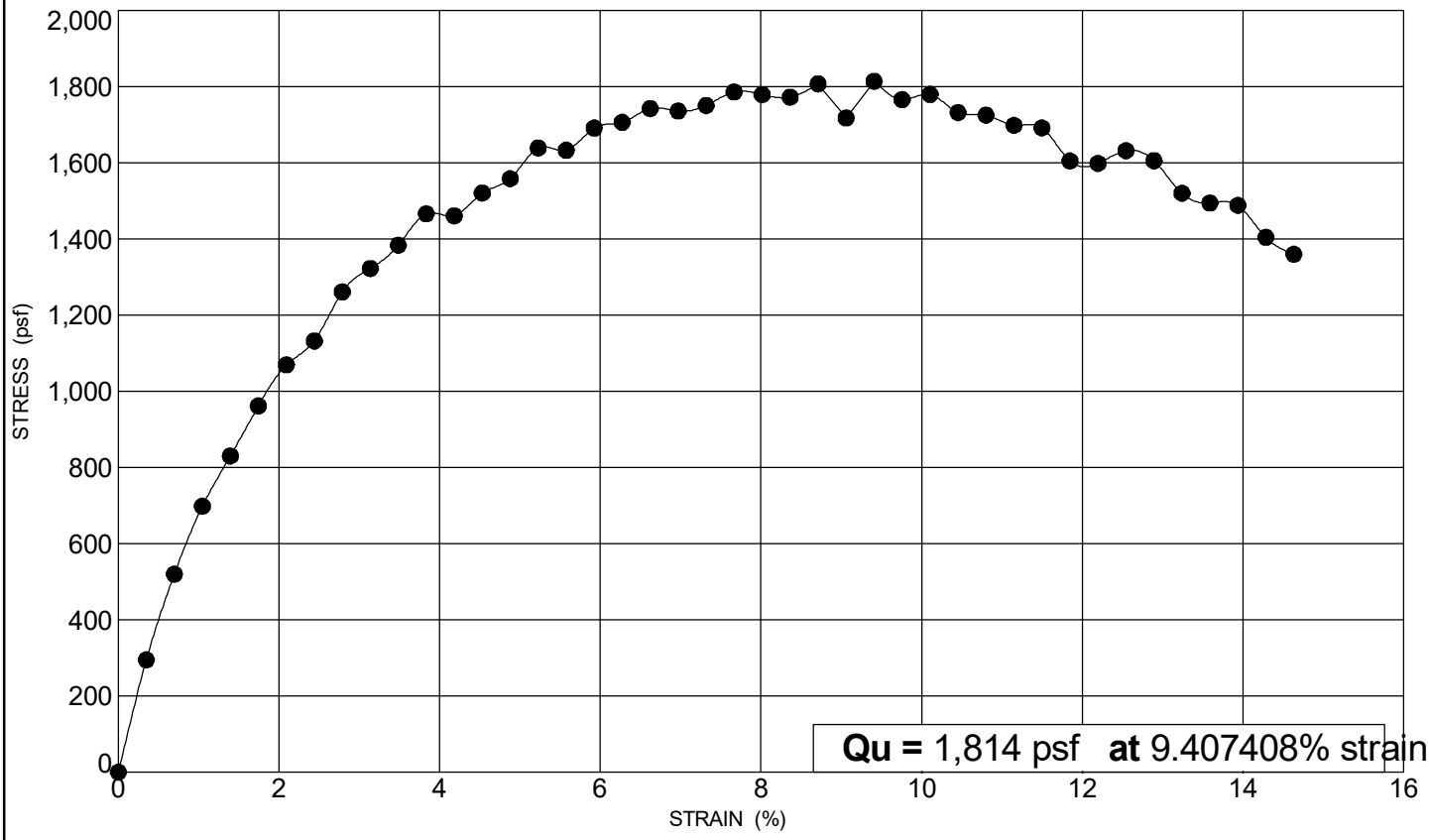
PROJECT MAINTENANCE FACILITY **PID**

OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-9 SAMPLE ID: ST-ST-2

STATION: NOT RECORDED DEPTH: 3.0 - 5.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS

FRONT VIEW SIDE VIEW

SPECIMEN DETAILS

HEIGHT: 5.74 inches

DIAMETER: 2.84 inches

WET UNIT WT:

DRY UNIT WT:

TESTED BY: CS 8/29/2024

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
-	-	-	-	-

ATTERBERG LIMITS MOISTURE

LL	PL	PI	WC
36	17	19	24

ODOT CLASS: HP (tsf): -

DESCRIPTION:

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 2/27/25 18:23 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECTS\2024\N1245108 - PREBLE CO MAINTENANCE FACILITY\FIELD-LAB\N1245108

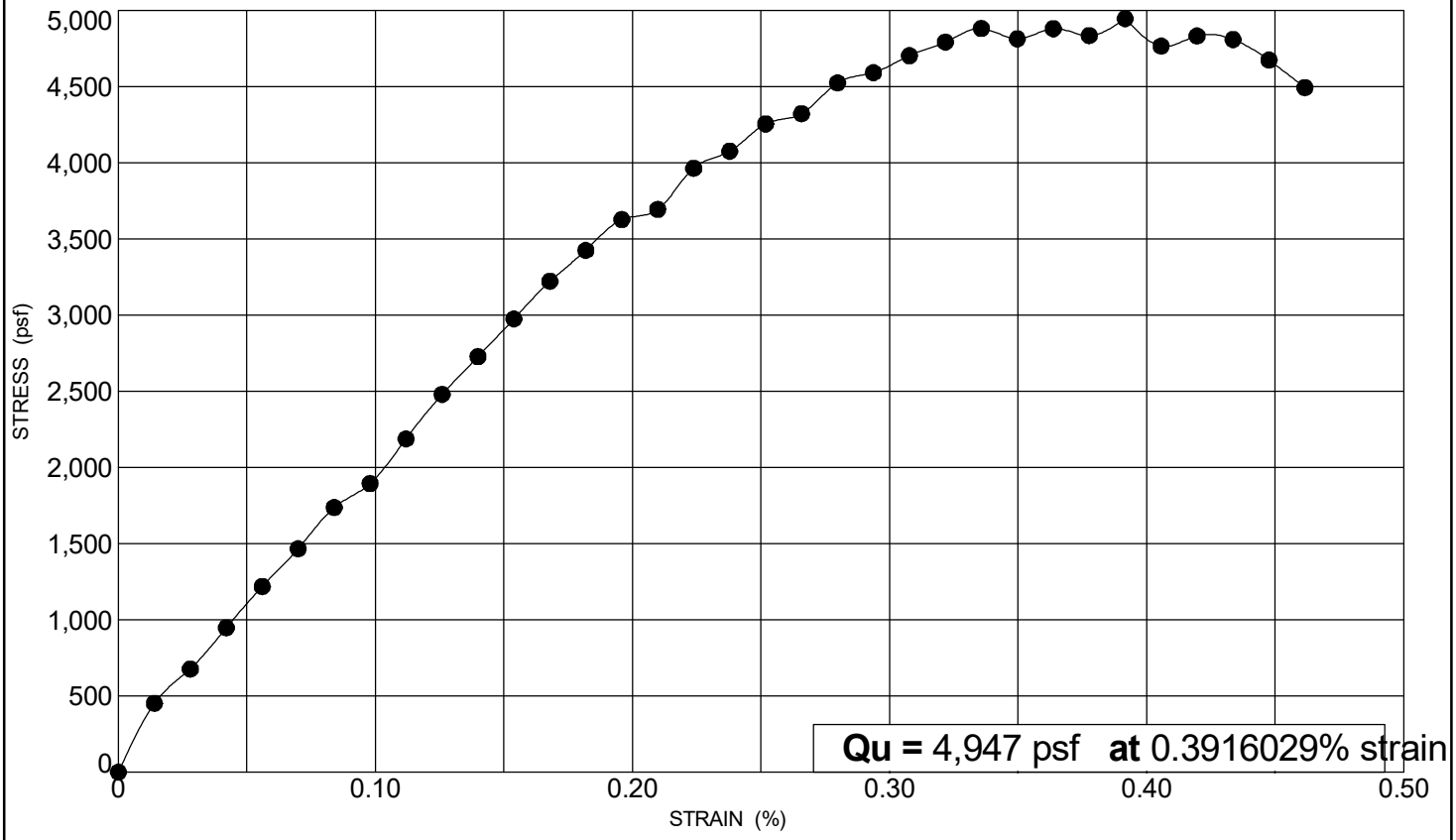
UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT MAINTENANCE FACILITY **PID**
OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION

SAMPLE IDENTIFICATION

BORING ID: B-13 SAMPLE ID: ST-ST-3
STATION: NOT RECORDED DEPTH: 6.0 - 8.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS

FRONT VIEW SIDE VIEW

SPECIMEN DETAILS

HEIGHT: 5.63 inches
DIAMETER: 2.85 inches
WET UNIT WT: 146.82 pcf
DRY UNIT WT: 132.78 pcf

TESTED BY: MF 2/18/2025

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
-	-	-	-	-

ATTERBERG LIMITS MOISTURE

LL	PL	PI	WC
21	12	9	12

ODOT CLASS: HP (tsf): -

DESCRIPTION:

OHDOT UNCONFINED COMPRESSION - OH DOT.GDT - 2/27/25 18:24 - C:\USERS\BMLANGLOIS\ONEDRIVE - TERRACON CONSULTANTS INC\DESKTOP\TEMP OFFLINE WORK\CIN\PROJECTS\2024\N1245108 - PREBLE CO MAINTENANCE FACILITY\FIELD-LAB\N1245108

UNCONFINED COMPRESSION TEST
AASHTO T - 208

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

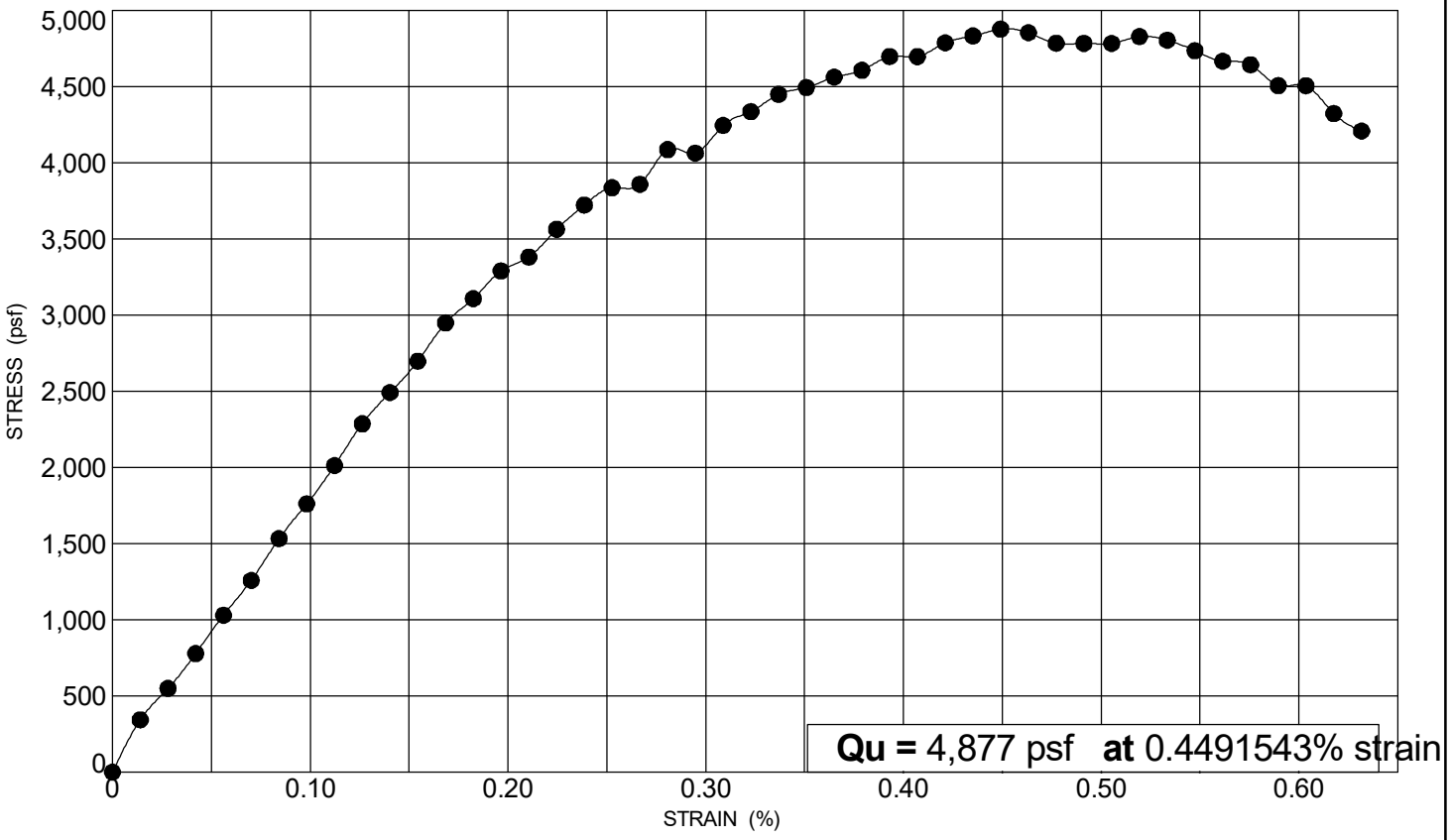
PROJECT MAINTENANCE FACILITY **PID**

OGE NUMBER N1245108 **PROJECT TYPE** STRUCTURE FOUNDATION

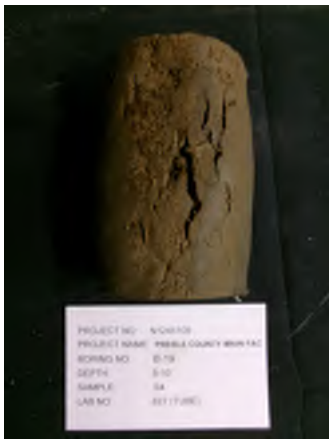
SAMPLE IDENTIFICATION

BORING ID: B-19 SAMPLE ID: ST-ST-4

STATION: NOT RECORDED DEPTH: 8.0 - 10.0 feet



SPECIMEN FAILURE SKETCHES OR PHOTOGRAPHS



FRONT VIEW SIDE VIEW

SPECIMEN DETAILS

HEIGHT: 5.61 inches

DIAMETER: 2.83 inches

WET UNIT WT: 147.35 pcf

DRY UNIT WT: 133.15 pcf

TESTED BY: MF 2/19/2025

CLASSIFICATION RESULTS

GRADATION (%)

GR	CS	FS	SI	CL
-	-	-	-	-

ATTERBERG LIMITS MOISTURE

LL	PL	PI	WC
18	12	6	12

ODOT CLASS: HP (tsf): -

DESCRIPTION:

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

Maintenance Facility
-

Preble County Full-Service Maintenance Facility - Preliminary Subgrade Analysis

Terracon Consultants

Prepared By: Brent Langlois, P.E.
Date prepared: Thursday, February 27, 2025

Brent Langlois
611 Lunken Park Drive
Cincinnati, Ohio 45226

(513) 321-5816
brent.langlois@terracon.com

NO. OF BORINGS: 7

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-3	Parking / Driveways				CME 55/300	90	974.0	974.0	0.0
2	B-4	Parking / Driveways				CME 55/301	90	977.0	976.0	1.0 C
3	B-23	Parking / Driveways				CME 55/302	89	980.0	979.0	1.0 C
4	B-24	Parking / Driveways				CME 55/303	89	979.0	976.0	3.0 C
5	B-25	Parking / Driveways				CME 55/304	89	975.0	975.0	0.0
6	B-26	Parking / Driveways				CME 55/305	89	972.0	974.0	2.0 F
7	B-27	Parking / Driveways				CME 55/306	89	971.0	974.0	3.0 F

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	1	1.0	2.5	1.0	2.5	9		4							11	10	A-4a	8			N_{60}		12"	
	3	2	3.0	5.0	3.0	5.0	12		1.5	21	13	8				12	10	A-4a	8						
		3	6.0	7.5	6.0	7.5	11		3							13	16	A-6b							
								9																	
2	B	1	1.0	2.5	0.0	1.5	14		4							14	10	A-4a	8			N_{60} & Mc		12"	
	4	2	3.5	5.0	2.5	4.0	17		1							13	14	A-6a	10						
		3	6.0	7.5	5.0	6.5	18		1.25							12	16	A-6b	16						
								14																	
3	B	1	1.0	2.5	0.0	1.5	16		1.5	54	22	32				25	19	A-7-6	19			HP & Mc		12"	
	23	2	3.5	5.0	2.5	4.0	15		2							27	18	A-7-6	16						
		3	6.0	7.5	5.0	6.5	18		3							12	14	A-6a	10						
								15																	
4	B	1	1.0	2.5	-2.0	-0.5	9		2.25							25	16	A-6b	16						
	24	2	3.5	5.0	0.5	2.0	18		4.5							16	16	A-6b	16						
		3	6.0	7.5	3.0	4.5	18		2							15	16	A-6b	16						
		4	8.5	10.0	5.5	7.0	12	12	2							12	16	A-6b							
5	B	1	1.0	2.5	1.0	2.5	12		1.25							31	18	A-7-6	16			HP & Mc		12"	
	25	2	3.5	5.0	3.5	5.0	13		4.25							18	16	A-6b	16						
		3	6.0	7.5	6.0	7.5	10		0.25	31	15	16				25	16	A-6b							
								10																	
6	B	1	1.0	2.5	3.0	4.5	16		1.5							25	18	A-7-6	16						
	26	2	3.5	5.0	5.5	7.0	15		2.25							13	14	A-6a							
		3	6.0	7.5	8.0	9.5	27		4.5							12	14	A-6a							
								15																	
7	B	1	1.0	2.5	4.0	5.5	27						10	4	14	18	10	A-2-4	0						
	27	2	3.5	5.0	6.5	8.0	15		2.25							12	14	A-6a							
		3	6.0	7.5	9.0	10.5	18		1.75							14	14	A-6a							
								27																	

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

PID: -

County-Route-Section: Maintenance Facility
No. of Borings: 7

Geotechnical Consultant: Terracon Consultants
Prepared By: Brent Langlois, P.E.
Date prepared: 2/27/2025

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	Option
206	Depth	12''

Excavate and Replace Stabilization Options	
Global Geotextile Override(N60L):	12''
Override(HP):	12''
Global Geogrid Override(N60L):	0''
Override(HP):	0''

Design CBR	5

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	6%
$N_{60} < 12$	17%	0.5 < HP ≤ 1	6%
$12 \leq N_{60} < 15$	28%	1 < HP ≤ 2	44%
$N_{60} \geq 20$	6%	HP > 2	39%
M+	17%		
Rock	0%		
Unsuitable	0%		

Excavate and Replace at Surface	
Average	0''
Maximum	0''
Minimum	0''

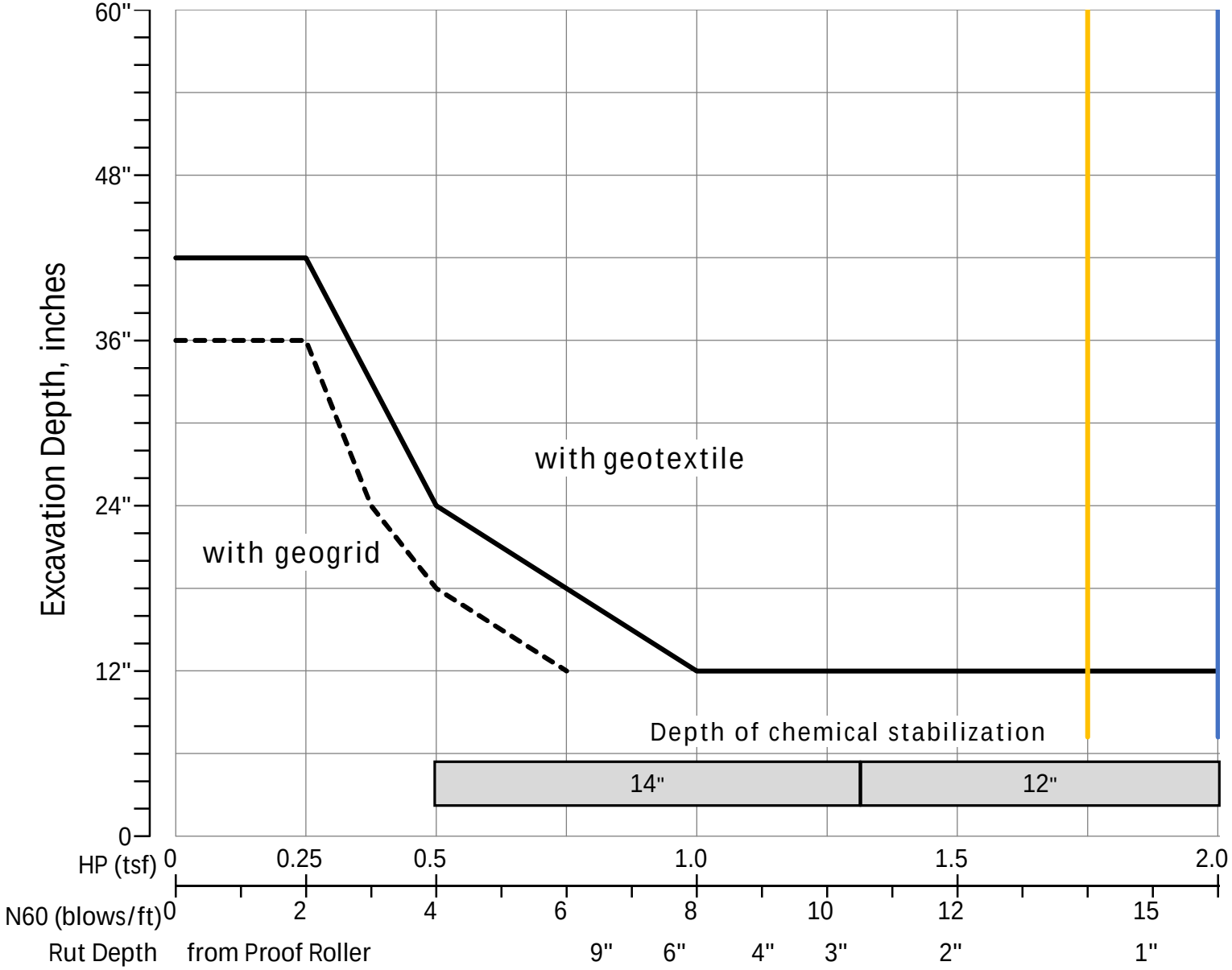
% Proposed Subgrade Surface	
Unstable & Unsuitable	50%
Unstable	50%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	16	15	2.39	35	17	19	10	4	14	17	15	13
Maximum	27	27	4.50	54	22	32	10	4	14	31	19	19
Minimum	9	9	0.25	21	13	8	10	4	14	11	10	0

Classification Counts by Sample

ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	0	0	1	0	0	0	0	0	3	0	0	6	7	0	4	0	0	21
Percent	0%	0%	0%	5%	0%	0%	0%	0%	0%	14%	0%	0%	29%	33%	0%	19%	0%	0%	100%
% Rock|Granular|Cohesive	0%	19%									81%								100%
Surface Class Count	0	0	0	0	0	0	0	0	0	2	0	0	1	2	0	3	0	0	8
Surface Class Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	13%	25%	0%	38%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
2.39	2.00	☑ HP
14.57	14.00	☑ N60L

Average HP
Average N_{60L}

Document 00 41 13 - Bid Form (General Contract / Electronic Bid)
State of Ohio Standard Requirements for Public Facility Construction

THIS SAMPLE BID FORM IS PROVIDED WITH THE PROJECT MANUAL AS A PLACEHOLDER ONLY – SUBMIT YOUR BID USING THE ELECTRONIC BID FORM ON HTTPS://BIDEXPRESS.COM

General Info

Alt Total: Bid Total:

Deadline
12/04/2025 02:00 PM EST

Advertised
11/12/2025

Number
DOT-200011

Business Name
Ohio Facilities Construction Commission

Description
New Full Service Maintenance Facility including Main building (Administration, Enclosed Vehicle Storage, Maintenance Garage), Cold Storage, Salt Storage, Bulk Material Storage, and Fuel Island. Existing buildings to be demolished once new facilities are completed. Project is two (2) phases in total.

Procurement Documents

DOT-200011 M160-00_10_00.EB-Solicitation_GC
→ Notice to Bidders

DOT-200011 ODOT Preble Bid Specifications – Volume 01
DOT-200011 ODOT Preble Bid Specifications – Volume 02
→ Procurement & Contracting Requirements and Specifications

DOT-200011 ODOT Preble Bid Drawings
→ Plans, elevations, sections, details, and schedules

3 Attachments

Contract Times and Addenda

Contract Times

The time for Substantial Completion of all Work is 588 consecutive days from the Notice to Proceed.

Phase 1, New Building Construction: 477 days from Notice to Proceed

Phases 2 & 3, Demolish existing building & New Parking Lot: 588 days from Notice to Proceed

Acknowledgement of receipt of Addenda

Date Addendum #1 Received	Date Addendum #2 Received	Date Addendum #3 Received	Date Addendum #4 Received

Base Bid Instructions

Enter the amount of the Base Bid for ALL LABOR AND MATERIALS to complete the scope of Work. Include the amount of each Allowance (if applicable) and the subtotal of each Unit Price Extension (if applicable) in the Base Bid amount. Failure to include Allowance or Unit Price Extensions in the Base Bid is the responsibility of the Bidder and will not be sufficient reason for adjustment of the Bid amount after the Bid deadline. Do not include Alternates (if applicable) in the Base Bid amount.

Base Bid (General Contract)

Item	Description	Base Bid Amount*	Extension
Base Bid	All Labor and Materials (include Allowances and Unit Price Extensions above)	_____	
1 Item		**Total:**	

Alternate Instructions

Enter the amount of each and every Alternate to ADD TO or DEDUCT FROM the Base Bid. Indicate amounts to DEDUCT FROM the Base Bid by entering a minus sign (-) before the amount entered. Do not include Alternate amounts in the Base Bid.

Alternates (General Contract)

Item	Description	Alternate Amount*	Extension
! Alternate: Owner-agency may award independently from entire bid.			
! Alternates are not included in bid total.			
Alternate 1	Masonry skirting provided for Administration section of Main Building	_____	
Alternate 2	Masonry skirty provided for Vehicle Storage and Maintenance Garage section of Main Building	_____	
2 Items	**Alternate Total:**	**Total:**	

Bidder Affirmation and Disclosure

The Bidder acknowledges that by submitting its Bid, the Bidder has read and understands the applicable Executive Orders regarding the prohibitions of performance of offshore services, locating State data offshore in any way, or purchasing from Russian institutions or companies. If awarded a Contract, the Bidder will become the Contractor and affirms that both the Contractor and its Subcontractors shall perform no services requested under this Contract outside of the United States.

The Bidder shall provide the locations where services under this Contract will be performed in the spaces provided below or by attachment. Failure to provide this information as part of its Bid may cause the Bidder to be deemed non-responsive and no further consideration will be given to its Bid. If the Bidder will not be using Subcontractors, indicate "Not Applicable" in the appropriate spaces.

1. Principal business location of Contractor:

Contractor Address*

City, State, and Zip*

Name / Principal business location of Subcontractor(s), if known at time of Bid deadline:

Subcontractor Name*

Address, City, State, and Zip*

2. Location(s) where services will be performed by Contractor (Project Sites):

Name*

Address, City, State, and Zip*

Name(s) / Location(s) where services will be performed by Subcontractors (Project Sites):

Subcontractor Name

Address, City, State, and Zip

3. Location(s) where State data will be located by Contractor:

Address*

City, State, and Zip*

Location(s) where State data will be located by Subcontractor(s), if known at time of Bid deadline:

Subcontractor Name

Address, City, State, and Zip

Bidder also affirms, understands and agrees that the Contractor and its Subcontractors are under a duty to disclose to the State any change or shift in location of services performed by the Contractor or its Subcontractors before, during and after execution of any Contract with the State. Bidder agrees it shall so notify the State immediately of any such change or shift in location of its services. The State has the right to immediately terminate the contract, unless a duly signed waiver from the State has been attained by the Contractor to perform the services outside the United States.

On behalf of the Bidder, I acknowledge that I am duly authorized to execute this electronic Bid Form including this Bidder Affirmation and Disclosure form and have read and understand that this form is a part of any Contract that Bidder may enter into with the State and is incorporated therein.

EDGE Program Commitment to Participate

Option A

The Bidder commits to meet or exceed the advertised EDGE Participation Goal of the Contract award amount, calculated as a portion of the Base Bid plus all accepted Alternates, by using EDGE-certified Business(es).

The Bidder agrees that if selected for consideration of the Contract, it shall provide (if not provided with the Bidder's Bid) to the Contracting Authority, at the location required and within 3 business days after receiving notice from the Contracting Authority, its fully completed Bidder's Qualification Form, including an EDGE Affidavit form for each EDGE-certified Business proposed for use by the Bidder if awarded the Contract for this Project.

Option B (indicate percentage of participation below)

The Bidder declares that it does not meet the advertised EDGE Participation Goal percentage, but, if awarded the Contract for this Project, commits to provide the percentage of the Contract award amount, indicated above, calculated as a portion of the Base Bid plus all accepted Alternates, by using EDGE-certified Business(es).

The Bidder acknowledges it understands the requirement for it to provide and agrees to provide to the Contracting Authority, if selected for consideration of the Contract, within 3 business days after notice from the Contracting Authority, a detailed Demonstration of Good Faith form describing its efforts undertaken prior to submitting its Bid to meet the advertised EDGE Participation Goal percentage for the Contract for this Project.

The Bidder commits to provide to the Contracting Authority at the location required, and within 3 days after receiving notice from the Contracting Authority, its fully completed Bidder's Qualifications Form, including an EDGE Affidavit form for each EDGE-certified Business proposed for use by the Bidder if awarded the Contract for this Project.

Option C

The Bidder declares that the Bidder is an EDGE-certified Business and that if awarded this Contract, the EDGE Participation percentage will be 100 percent of the Contract award amount.

Select EDGE option above*

Choices…

If option B selected, enter percentage

Certifications (State Prevailing Wages)

1. The Bidder has read and understands the proposed Contract Documents and agrees to comply with all requirements of the proposed Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder, which might indicate a contrary intention.

2. The Bidder represents that the Bid is based upon the Basis of Design and Acceptable Components specified by the proposed Contract Documents.

3. The Bidder has visited the Site, become familiar with local conditions, and has correlated personal observations about the requirements of the proposed Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the proposed Contract Documents.

4. The Bidder understands that the execution of the Project will require sequential, coordinated, and interrelated operations, which may involve interference, disruption, hindrance, or delay in the progress of the Bidder's Work. The Bidder agrees that the Contract Sum, as amended from time to time, shall cover all amounts due from the State resulting from interference, disruption, hindrance, or delay that is not caused by the State or its agents and employees. The Bidder agrees that any such interference, disruption, hindrance, or delay is within the contemplation of the Bidder and the State and that the Contractor's sole remedy from the State for any such interference, disruption, hindrance, or delay shall be an extension of time in accordance with the proposed Contract Documents.

5. During the performance of the Contract, the Bidder agrees to comply with Ohio Administrative Code ("OAC") Chapters 123:2-3 through 123:2-9 and agrees to incorporate the monthly reporting provisions of OAC Section 123:2-9-01 into all subcontracts on the Project, regardless of tier. The Bidder understands the State's Equal Opportunity Coordinator or the Contracting Authority may conduct pre-award and post-award compliance reviews to determine if the Bidder maintains nondiscriminatory employment practices, maintains an affirmative action program, and is exerting good faith efforts to accomplish the goals of the affirmative action program. For a full statement of the rules regarding Equal Employment Opportunity in the Construction Industry, see OAC Chapters 123:2-1 through 123:2-9.

6. The Bidder and each Person submitting a Bid on behalf of the Bidder certifies, and in the case of a Bid by a joint venture each member thereof certifies as to such member's entity, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices, and any Alternate bid in the Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bid with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the Bid have not been knowingly disclosed by the Bidder and shall not knowingly be disclosed by the Bidder prior to the bid opening, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices, or Alternate bid; (c) no attempt has been made or shall be made by the Bidder to induce any other Person to submit or not to submit a Bid for the purpose of restricting competition.

7. The Bidder shall execute the Agreement with the Contracting Authority, if a Contract is awarded on the basis of this Bid, and if the Bidder does not execute the Agreement for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the State as provided in Article 5 of the Instructions to Bidders.

8. The Bidder certifies that the upon the award of a Contract, as the Contractor it shall make a good faith effort to ensure that all of the Contractor's employees, while working on the Site, shall not purchase, transfer, use, or possess illegal drugs or alcohol or abuse prescription drugs in any way.

9. The Bidder acknowledges that it read all of the Instructions to Bidders, and in particular, Section 2.10 - Submittals With Bid Form, and by submitting its Bid certifies that it has read the Instructions to Bidders and it understands and agrees to the terms and conditions stated in them.

10. The Bidder agrees to furnish any information requested by the Contracting Authority or the Architect/Engineer to evaluate the responsibility of the Bidder.

11. The Bidder agrees to furnish the submittals required by Section 6.1 of the Instructions to Bidders for execution of the Agreement within 10 days of the date of the Notice of Intent to Award.

12. When the Bidder is a corporation, partnership or sole proprietorship, an officer, partner or principal of the Bidder, as applicable, shall enter the legal name of the Bidder and the name of the officer, partner or principal of the Bidder (in lieu of signing the Bid Form) in the data fields provided.

13. When the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall enter the legal name of the applicable member and the name of the officer, partner or principal (in lieu of signing the Bid Form) in the data fields provided.

14. The Bidder understands that the Contract is subject to all the provisions, duties, obligations, remedies and penalties of Ohio Revised Code Chapter 4115 and that the Bidder shall pay any wage increase in the locality during the term of the Contract.

15. The Bidder represents that the individual that is submitting and digitally signing the electronic Bid is legally authorized to do so.

16. Bidder acknowledges that by the act of submitting an electronic Bid that it is digitally signing the actual Bid, which shall serve as the Bidder's authorization for the further consideration and activity in the bidding and contract process.

☐ The Bidder hereby acknowledges that the above representations in this Bid are material and not mere recitals.*

Procurement Forms

Document DOT-200011 00 43 13 - Bid Security Form
→ Upload below and provide original document within 3 days

Document DOT-200011 00 45 13 - Bidder's Qualifications
→ Upload below or provide within 3 days of request

Document DOT-200011 00 45 39 - EDGE Affidavit
→ Upload below or provide within 3 days of request

3 Attachments

Instructions for Providing Bid Submittals

Submission of Electronic Facsimile of Bid Guaranty with Electronic Bid

The Bidder SHALL UPLOAD and ATTACH TO ITS BID an ELECTRONIC FACSIMILE (scanned PDF document) OF ITS BID GUARANTY, payable to the Contracting Authority, in the form of either: (1) the signed and sealed Document 00 43 13 - "Bid Security Form" contained in the Contract Documents (and provided for the Bidder's convenience in the block above) for the amount of the Base Bid plus all additive Alternates; or (2) a certified check, cashier's check, or letter of credit, for 10 percent of the Base Bid, plus all additive Alternates – a letter of credit shall expressly provide that it is revocable only by the Contracting Authority. Refer to Sections 2.10.1.1 and 5.1 of Document 00 21 13 - "Instructions to Bidders."

Submission of Original Bid Guaranty

In addition to the Electronic Facsimile above, the Bidder SHALL DELIVER ITS ORIGINAL UNALTERED BID GUARANTY to the Project Coordinator at the address identified below WITHIN 3 BUSINESS DAYS AFTER THE BID DEADLINE as provided in Ohio Administrative Code Section 153:1-8-01(H). THIS REQUIREMENT APPLIES TO ALL BIDDERS. Refer to Section 2.10.1.2 of the Instructions to Bidders.

Kaitlyn Gardner
Project Coordinator
Ohio Facilities Construction Commission
30 W Spring Street, 4th Floor
Columbus, Ohio 43215

Non-responsive Bid for Failure to Submit Bid Guaranty

Each Bidder MUST SUBMIT BOTH THE ELECTRONIC FACSIMILE AND THE ORIGINAL UNALTERED BID GUARANTY as described above. The Contracting Authority SHALL REJECT A BID AS NON-RESPONSIVE if the Bidder fails to submit BOTH elements of the Bid Guaranty. The checkboxes below are to identify that you have uploaded the other form of Bid Guaranty. DO NOT CHECK ALL BOXES. Refer to Section 2.10.1 of the Instructions to Bidders.

Submission of Bidder's Qualifications and EDGE Affidavit

The Bidder is encouraged to submit background information with its Bid using Document 00 45 13 - "Bidder's Qualifications" and Document 00 45 39 - "EDGE Affidavit" with the EDGE-certified Business(es) the Bidder proposes to use on the Project (forms provided for the Bidder's convenience in the block above). If the Bidder does not submit the Bidder's Qualifications form and/or the EDGE Affidavit form and related information attached to the electronic Bid Form, the Bidder shall provide it within 3 days of request. Refer to Sections 2.10.3 and 3.5.4 of the Instructions to Bidders.

Required Bid Guaranty Upload

Name	File*
Document 00 43 13 - Bid Security Form → Upload a scan of the fully executed Bid Security Form AND submit the original document to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Bidder submitted a Cashier's check below)

Power of Attorney → Upload a scan of the fully executed Power of Attorney AND submit the original document to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected I am NOT enclosing this document because the omission terms have been met. (Bidder submitted a Cashier's check below OR included with the Bid Security Form above)
Cashier's Check for 10% of the Bid → Upload a scan of the Cashier's Check AND submit the original check to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected I am NOT enclosing this document because the omission terms have been met. (Bidder submitted the Bid Security Form AND Power of Attorney above)
3 Required Documents	

Bidder's Qualifications and EDGE Affidavit Upload

Name	File*
Document 00 45 13 - Bidder's Qualifications → Upload fully completed form and attachments	Select file... no file selected I am NOT enclosing this document because the omission terms have been met. (Must be submitted to the Contracting Authority within 3 days of request)
Document 00 45 39 - EDGE Affidavit → Upload a completed form for each EDGE business	Select file... no file selected I am NOT enclosing this document because the omission terms have been met. (Must be submitted to the Contracting Authority within 3 days of request)
2 Required Documents	

Bidder Signatory Information

Bidder Signatory

Name of Bidder's Authorized Signatory:* **Title of Authorized Signatory:***

All Bidders complete all information in this form. Duplicate and complete the block below for each Joint Venturer:

Bidder Information

Business Name:*

Business Mailing Address, City, State, Zip:*

Telephone Number:* **Facsimile Number:** **Email Address:***

Federal Tax ID Number:* **State of Incorporation (if applicable):**

Contact person for Contract processing:* **Date enrolled in an OBWC-approved DFSP (month/date/year):**

President or Chief Executive Officer's Name:* **President or Chief Executive Officer's Title:***

END OF DOCUMENT

Document 00 43 13 - Bid Security Form
State of Ohio Standard Requirements for Public Facility Construction

(Form of combined Bid Guaranty and Bond prescribed by Ohio Revised Code Section 153.571)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____

_____, as Principal,

and _____ as Sureties,

are hereby held and firmly bound unto _____

_____ as Obligee(s), in the penal sum of the dollar amount of the Bid submitted by the Principal

to the Obligee on _____ (date) to undertake the Project known as:

Project Number: _____

Project Name: _____

Contract Description: _____
(e.g., General Contractor/Trades, Plumbing, HVAC, Electrical)

The penal sum, referred to herein, shall be the dollar amount of the Principal's Bid to the Obligee, incorporating any additive alternate Bids made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of dollars ($_____). (If the preceding line is left blank, the penal sum will be the full amount of the Principal's Bid, including add alternates. Alternatively, if completed, the amount stated shall not be less than the full amount of the Bid, including Alternates, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named Principal has submitted a Bid for the above referenced Project;

NOW, THEREFORE, if the Obligee accepts the Bid of the Principal, and the Principal fails to enter into a proper contract in accordance with the Bid, Plans, Specifications, details, and bills of material; and in the event the Principal pays to the Obligee the difference, not to exceed ten percent of the penal sum hereof between the amount specified in the Bid and such larger amount for which the Obligee may in good faith contract with the Bidder determined by the Obligee to be the next lowest responsive and responsible to perform the Work covered by the Bid; or in the event the Obligee does not award the Contract to such next lowest responsive and responsible Bidder and resubmits the Project for bidding, the Principal pays to the Obligee the difference not to exceed ten percent of the penal sum hereof between the amount specified in the Bid, or the costs, in connection with the resubmission, of printing new Contract Documents, required advertising and printing and mailing notices to prospective Bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect. If the Obligee accepts the Bid of the Principal, and the Principal, within 10 days after the awarding of the Contract, enters into a proper contract and executes the Agreement Form in accordance with the Contract Documents, including without limitation the Bid, Plans, Specifications, details, and bills of material, which said Contract is made a part of this Bond the same as though set forth herein; and

NOW ALSO, IF THE SAID Principal shall well and faithfully perform each and every condition of such Contract; and indemnify the Obligee against all damage suffered by failure to perform such Contract according to the provisions thereof and in accordance with the Contract Documents, including without limitation Plans, Specifications, details, and bills of material therefore; and shall pay all lawful claims of Subcontractors, Material Suppliers and laborers for labor performed and materials furnished in the carrying forward, performing or completing of said Contract; we, agreeing and assenting that this undertaking shall be for the benefit of any Subcontractor, Material Suppliers or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions or additions, in or to the terms of said Contract, the Work thereunder or the Contract Documents, including without limitation the Plans and Specifications, therefore, shall in any way affect the obligations of said Surety on its bond, and it does hereby waive notice of any such modifications, omissions or additions in or to the terms of the Contract, the Work, or the Contract Documents, including without limitation the Plans and Specifications.

SIGNED AND SEALED this _____ day of _____ , _____ .

PRINCIPAL:

_____
Signature

By: _____
Name

_____
Title

SURETY:

_____
Signature

By: _____
Attorney-in-Fact

SURETY INFORMATION:

_____
Name

_____
Address 1

_____
Address 2

_____
City State Zip

_____
Telephone

_____
Email

SURETY AGENT'S INFORMATION:

_____
Name

_____
Address 1

_____
Address 2

_____
City State Zip

_____
Telephone

_____
Email

END OF DOCUMENT

Document 00 45 13 - Bidder's Qualifications
State of Ohio Standard Requirements for Public Facility Construction

Project Number: _____

Project Name: _____

1. **Company Name**: _____

   Physical Address: _____
   Street, Building, Unit

   _____
   City, State, Zip

   Mailing Address (if different): _____
   P.O. Box

   _____
   City, State, Zip

   Telephone Number (w/ Area Code): (_____) _____

   Fax Number (w/ Area Code): (_____) _____

   Email address: _____

2. **Overall Experience.** Indicate Bidder's overall experience performing the trades bid, including the years in business performing the trade under present and former business names.

3. **Financial.** The apparent low Bidder shall submit, upon request of the Contracting Authority, either:

   a) An annual financial statement prepared within the 12 months prior to the bid opening by an independent licensed accounting firm; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking; or,

   b) A financial report generated within 30 days prior to the bid opening from Standard and Poor, Dun and Bradstreet or a similar company acceptable to the Contracting Authority documenting the financial condition of the Bidder; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking;

   This information is not a public record under Ohio Revised Code Section 149.43; and shall remain confidential, except under proper order of a court.

4. **Facilities & Equipment**. Indicate Bidder's relevant facilities and major equipment (leased or owned).

5. **Ongoing & Relevant Projects.** List all ongoing projects and projects completed in the last 5 years, which are similar in cost and type to the Project. Include scope of Work, Contract value, a description of EDGE participation and performance, and project name/contact person/address/phone number for each owner and the architect or engineer for each project.

6. **Regulatory / Contractual.** Indicate all occurrences of the following in the last 5 years (indicate if none). For verification, attach documentation, and/or provide sufficient and appropriate detail information such as: project name, owner, contact person and phone number, amount of contract, etc.

    a) State or federal Prevailing Wage violations or judgments

    b) Affirmative Action and EDGE program violations (Attach Certificate of Compliance with Affirmative Action Programs, issued pursuant to Ohio Revised Code Section 9.47)

    c) Contract abandonment, contract termination, as either a prime- or sub-contractor, or Surety takeover

    d) Debarment by state, federal, or local jurisdictions

e) EPA/OSHA violations

f) Liquidated damages and Statutory Delay Forfeiture assessed

g) Drug-Free Safety Program and Drug Free Workplace Program violations

7. Management. Identify individuals assigned to this Project.

Principal _____ Years with firm _____ Total Exp._____

Project Manager _____ Years with firm _____ Total Exp._____

Field Superintendent _____ Years with firm _____ Total Exp._____

8. EDGE Participation. Identify EDGE-certified Business Enterprises proposed as Subcontractors and Material Suppliers for this Project. Attach a fully completed Document 00 45 39 - "EDGE Affidavit" for each EDGE-certified Business Enterprise.

9. Certification. I hereby certify that the information in this entire Bidder's Qualifications form, including all attachments and referenced information, is factual and complete.

Company Name _____

Authorized Official (please print or type) _____

Signature of Authorized Official _____ Date _____

END OF DOCUMENT

Document 00 45 39 - EDGE Affidavit
State of Ohio Standard Requirements for Public Facility Construction

EDGE PARTICIPATION

Certified Statement of Intent to Contract and Perform

Bidder or Proposer: Submit one fully completed form for each EDGE-certified Business

Project: _____

Project Name: _____

A. Bidder or Proposer's Company Name: _____

Mark all that apply:

☐ Multi-Prime Contract ☐ General Contract ☐ CM at Risk Contract ☐ Design-Build Contract

B. EDGE-certified Business information (for contract at ANY tier)

Mark all that apply:

☐ Subcontractor ☐ Material Supplier ☐ Professional Services ☐ Goods & Services

EDGE Business Name: _____

EDGE Business Address: _____

_____

EDGE Certification Number: _____ E-mail: _____

Contact Person: _____ Phone: _____

Insert detailed description of materials, labor, services, supplies, etc. (may use industry codes – continue on separate page):

_____

_____

_____

C. Certification of Intent

By signing below, the Bidder or Proposer certifies that it intends to contract with the EDGE-certified Business for the portion of the contract described above related to its Contract for this Project and for the estimated cost shown below. By signing below, the EDGE-certified Business certifies that it intends to contract with the Bidder or Proposer and intends to provide the portion of the contract described above related to the Contract for this Project for the estimated cost of:

_____ and _____ /100 dollars ($_____).

In the event the named Bidder or Proposer is NOT awarded a Contract, this Statement shall be null and void.

EDGE-certified Business	***Bidder or Proposer***
_____	_____
Authorized Signature	Authorized Signature
_____	_____
Name and Title	Name and Title
_____	_____
Date Signed	Date Signed

END OF DOCUMENT

Document 00 52 00 - Agreement Form
State of Ohio Standard Requirements for Public Facility Construction

This Agreement is made as of the date set forth below between the State of Ohio, acting by and through the Contracting Authority, and the Contractor in connection with the Project.

Project Number:	**DOT-200011**
Project Name:	**Preble County Full Service Maintenance Facility**
Site Address:	234 Quaker Trace Rd West Alexandria, OH, 45381 Preble County
Owner:	**ODOT Division of Facilities and Equipment Management**
Owner's Representative:	Carrie Yost
Address:	1980 W. Broad St. Columbus, OH 43223
Contracting Authority:	**Ohio Facilities Construction Commission**
Project Manager:	Ben Trick
Address:	30 W. Spring Street, 4th Floor Columbus, OH 43215
Contractor:	**«insert name»**
Contractor's Principal Contact:	«insert name»
Address:	«insert street address» «insert city, state zip code»
Architect/Engineer ("A/E"):	**B&N / KZF Joint Venture, LLC**
A/E's Principal Contact:	Chad R. Kohler
Address:	700 Broadway Street Cincinnati, OH 45202

ARTICLE 1 - SCOPE OF WORK; EDGE COMMITMENT

1.1 The project delivery method for this Project shall be General Contracting.

1.2 The Contractor shall contract with EDGE-certified Business(es) for not less than five (5) percent of the Contract Sum.

ARTICLE 2 - COMPENSATION

2.1 The Owner shall pay the Contractor the Contract Sum for the Contractor's proper, timely, and complete performance of the Contract. The Contract Sum is **$«insert amount»**, subject to Modifications as provided in the Contract Documents. The Contract Sum is comprised of the following:

2.1.1 Base Bid: .....$«Insert Base Bid Amount»

2.1.2 Alternate «Insert Alternates Awarded»: $«Insert Alternate Amount»

2.1.3 Alternate «Insert Alternates Awarded»: $«Insert Alternate Amount»

2.2 The funding for the Project, including funds retained from payments to the Contractor, will not accrue interest for the benefit of the Project or the Contractor.

ARTICLE 3 - CONTRACT TIMES

3.1 The Contract Times are the periods established in the following table for the achievement of the associated Milestones:

Construction Stage Milestone(s) to which Liquidated Damages apply	**Contract Time**	**Projected Date** (as of the date of this Agreement)
Phase 1 – New Buildings Construction	477 Days	05/21/2027
Phases 2 & 3 – Demolition of Existing Buildings & New Parking Lot	588 Days	09/09/2027
Substantial Completion of all Work	588 Days	09/09/2027

3.1.1 The projected dates listed under "Projected Date (as of the date of this Agreement)" are **(1)** based upon an anticipated, but not guaranteed, Date of Commencement of «insert date»; and **(2)** provided only for convenient reference during consideration of the Agreement. The durations listed under "Contract Time" define the Contract Times and take precedence over the projected dates.

ARTICLE 4 - KEY PERSONNEL

4.1 The Contractor's key personnel for the Project are:

4.1.1 «insert name», Project Manager;

4.1.2 «insert name», Lead Scheduling Engineer;

4.1.3 «insert name», General Superintendent.

4.2 The Contractor's key personnel are authorized to act on the Contractor's behalf with respect to the Project and all matters concerning the Project.

ARTICLE 5 - GENERAL PROVISIONS

5.1 Effectiveness.

5.1.1 It is expressly understood by the Contractor that none of the rights, duties, and obligations described in the Contract Documents shall be valid and enforceable unless the Director of the Office of Budget and Management first certifies that there is a balance in the Owner's appropriation not already encumbered to pay existing obligations and until all relevant statutory provisions of the Ohio Revised Code, including ORC Section 126.07, have been complied with, and until such time as all necessary funds are available or encumbered and, when required, such expenditure of such funds is approved by the State Controlling Board, or other applicable approving body.

5.1.2 In addition, if federal funds are to be used to pay fees and expenses under this Agreement, none of the rights, duties, and obligations contained in this Agreement shall be binding on any party until the Owner gives the Contractor written notice that such funds are available from the Owner's funding source.

5.1.3 Subject to **Section 5.1.1**, the Contract shall become binding and effective upon execution by the Contracting Authority, Owner, Contractor, and Ohio Attorney General.

5.1.3.1 If the Contractor is a joint venture, **(1)** each individual joint venturer shall **(a)** sign the Agreement in its own name and **(b)** be a party to the Contract, and **(2)** the Contract and the Performance and Payment Bond shall be binding on and apply to all joint venturers jointly and severally.

5.1.3.2 If the Contractor is a limited liability company, which the Contracting Authority reasonably believes to be a special purpose or similar entity, the Contracting Authority may in its discretion require the limited liability company and each member of the limited liability company to **(1)** sign the Agreement in its own name and **(2)** be a party to the Contract. In that case, the Contract and the Performance and Payment Bond shall be binding on and apply to the limited liability company and to all of its members jointly and severally.

5.1.4 This Agreement may be executed in several counterparts, each of which shall constitute a complete original Agreement, which may be introduced in evidence or used for any other purpose without production of any other counterparts.

5.2 Representations.

5.2.1 The Contractor represents and warrants that it is not subject to an unresolved finding for recovery under ORC Section 9.24. If this representation and warranty is found to be false, the Contract is void, and the Contractor shall immediately repay to the Owner any funds paid under this Contract.

5.2.2 The Contractor hereby certifies that neither the Contractor nor any of the Contractor's partners, officers, directors, shareholders nor the spouses of any such person have made contributions in excess of the limitations specified in ORC Section 3517.13.

5.2.3 The Contractor, by signature on this Agreement, certifies that it is currently in compliance with, and will continue to adhere to, the requirements of Ohio ethics laws and conflict of interest laws and will take no action inconsistent with those laws.

5.2.4 The Contractor affirms to have read and understands Executive Order 2019-12D and shall abide by those requirements in the performance of this Contract. Notwithstanding any other terms of this Contract, the State reserves the right to recover any funds paid for services the Contractor performs outside of the United States for which it did not receive a waiver. The State does not waive any other rights and remedies provided the State in this Contract.

5.2.5 The Contractor affirms to have read and understands Executive Order 2022-02D regarding the prohibition of purchases from or investment in a Russian institution or company and shall abide by those requirements in the performance of this Contract. Notwithstanding any other terms of this Contract, the State reserves the right to recover any funds paid to the Contractor for purchases or investments in a Russian institution or company in violation of this paragraph. The provisions of this paragraph will expire when the applicable Executive Order is no longer effective.

5.2.6 During the performance of this Contract, if the Contractor changes the location(s) disclosed on the **Affirmation and Disclosure Form** (a page in its **Bid Form**), the Contractor must complete and submit a revised **Affirmation and Disclosure Form**.

5.2.7 Pursuant to ORC Section 9.76(B), the Contractor warrants that it is not boycotting any jurisdiction with whom the State of Ohio can enjoy open trade, including Israel, and will not do so during the term of this Contract.

ARTICLE 6 - Enumeration of Documents

6.1 The Contract Documents constitute the substance of the Contract, and include this Agreement, Drawings, Specifications, Addenda if any, **Contracting Definitions**, **General Conditions**, Supplementary Conditions if any, **Bid Form**, **Wage Rate Requirements**, **Bid Guaranty and Contract Bond** or **Performance and Payment Bond**, and Change Orders if any.

Chief Financial Officer

SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date set forth below:

«INSERT CONTRACTOR'S NAME»	**STATE OF OHIO**
_____	_____
Signature	*Signature*
_____	_____
Printed Name	*Printed Name*
_____	_____
Title	*Title*
OWNER'S CONCURRENCE by ODOT Division of Facilities and Equipment Management	**OHIO ATTORNEY GENERAL** Approval as to Form

Signature	*Signature*
Printed Name	*Printed Name*
Title	*Title*
	Date

END OF DOCUMENT

Document 00 52 14 - State of Ohio Subcontract Form
State of Ohio Standard Requirements for Public Facility Construction

This Agreement is made as of the date set forth below between the Contractor and the Subcontractor in connection with the Project.

Project Number:	**DOT-200011**
Project Name:	**Preble County Full Service Maintenance Facility**
Site Address:	234 Quaker Trace Rd West Alexandria, OH, 45381 Preble County
Contractor:	**«insert name»**
Contractor's Principal Contact:	«insert name»
Address:	«insert street address» «insert city, state zip code»
Subcontractor:	**«insert name»**
Subcontractor's Principal Contact:	«insert name»
Address:	«insert street address» «insert city, state zip code»
Public Authority:	**Ohio Facilities Construction Commission**
Public Authority Contact:	Kaitlyn Gardner
Address:	30 W. Spring Street, 4th Floor Columbus, OH 43215

ARTICLE 1 - NATURE OF SUBCONTRACT

1.1 The Subcontractor shall perform the entire Subcontract Work as specified in Exhibit «N» and described in the Contract Documents for the Project.

ARTICLE 2 - COMPENSATION

2.1 The Contractor agrees to pay for the performance of this Subcontract, subject to additions and deductions as provided in the Contract Documents, the Subcontract Sum of «insert Subcontract Sum», comprised of the following:

«insert Subcontract Sum component» ..... $«insert amount»

«insert Subcontract Sum component» ..... $«insert amount»

«insert Subcontract Sum component» ..... $«insert amount»

«insert Subcontract Sum component» ..... $«insert amount»

ARTICLE 3 - TIME OF PERFORMANCE

3.1 Time is of the essence. The Subcontractor shall diligently prosecute and complete all Subcontract Work in accordance with the construction progress schedule agreed between the parties.

ARTICLE 4 - CONTRACT DOCUMENTS

4.1 To the extent that the contract between the Public Authority and the Contractor applies to the Subcontract Work:

4.1.1 The Contractor and the Subcontractor agree to be mutually bound by the terms of the Contract Documents;

4.1.2 The Contractor assumes toward the Subcontractor the rights, remedies, obligations, and responsibilities that the Public Authority has and assumes toward the Contractor;

4.1.3 The Subcontractor assumes toward the Contractor the rights, remedies, obligations, and responsibilities that the Contractor assumes toward the Public Authority; and

4.1.4 The Subcontractor agrees to perform its portion of the Work in accordance with the Contract Documents.

4.2 The Subcontract and any modifications, amendments, or alterations thereto shall be governed, construed, and enforced by and under the laws of the State of Ohio.

4.3 If any term or provision of the Subcontract, or the application thereof to any Person or circumstance, is finally determined, to be invalid or unenforceable by a court of competent jurisdiction, the remainder of the Subcontract or the application of such term or provision to other Persons or circumstances, shall not be affected thereby, and each term and provision of the Subcontract shall be valid and enforced to the fullest extent permitted by law.

4.4 The Subcontract shall be binding on the Contractor and Subcontractor, their successors and assigns, in respect to all respective covenants and obligations contained in the Contract Documents, but the Subcontractor may not assign the Subcontract without the prior written consent of the Contractor and the Public Authority.

ARTICLE 5 - EFFECTIVENESS

5.1 The Subcontract shall become binding and effective upon execution by the Contractor.

5.2 This Subcontract has been executed in several counterparts, each of which shall constitute a complete original Subcontract, which may be introduced in evidence or used for any other purpose without production of any other counterparts.

5.3 Any signatory may deliver a copy of its counterpart signature page to this Subcontract via fax or e-mail. Each signatory shall be entitled to rely upon a signature of any other signatory delivered in such a manner as if such signature were an original.

ARTICLE 6 - REPRESENTATIONS

6.1 Contingent Assignment. The Contractor's contingent assignment of this Subcontract to the Public Authority, as provided in the Contract, is effective after termination of the Contractor by the Public Authority and the Public Authority's acceptance of the assignment in writing to the Subcontractor. The Subcontractor consents to the assignment and shall be bound at the same price and terms as in the Subcontract to the Public Authority. Unless the Public Authority takes assignment of the Subcontract, the Subcontractor will not have any contractual rights against the Public Authority.

6.2 Intended Third-Party Beneficiary. The Public Authority is an intended third party beneficiary of the Subcontract, entitled to enforce any rights thereunder for its benefit.

6.3 Insurance. The Subcontractor shall maintain insurance in accordance with the Contract Documents. Exhibit «N» sets forth the minimum limits of liability for the insurance required in the Contract Documents.

6.4 Right to Audit. The Subcontractor agrees that the Public Authority or any agents designated by the Public Authority have access to and the right to audit and the right to copy at the Public Authority's cost all of the Subcontractor's books, records, contracts, correspondence, instructions, drawings, receipts, vouchers, purchase orders, and memoranda relating to the Work for a period of not less than 3 years following completion of the Work consistent with Ohio Revised Code ("ORC") Section 149.43 with regard to the Public Authority's obligation to maintain confidentiality of trade secrets.

6.5 Indemnity. To the fullest extent permitted by law, the Subcontractor shall indemnify, defend, and hold harmless the Public Authority, the Contractor, their consultants and employees from all claims and expenses for bodily injury and property damage other than to the Work itself that may arise from the performance of the Subcontract Work, including reasonable attorneys' fees, costs and expenses, but only to the extent caused by the negligent acts or omissions of the Subcontractor or a person or entity for whom the Subcontractor may be liable. This Subcontract does not require a Subcontractor to waive its immunity under the Workers Compensation laws of Ohio from claims brought against the Subcontractor by the Subcontractor's employees.

6.6 Prompt Pay. The Contractor shall at a minimum make payments to the Subcontractor in accordance with Applicable Law, including ORC Section 4113.61. Progress payments to the Subcontractor for satisfactory performance of Subcontract Work shall be made no later than 10 days after receipt by the Contractor of payment from the Public Authority for Subcontract Work.

6.7 Retainage. Subcontractor retainage shall be at a rate equal to the percentage retained from the Contractor's payment by the Public Authority for the Subcontract Work, unless a lesser percentage is otherwise specified.

6.7.1 Labor Payments.

6.7.1.1 Partial payments to the Subcontractor for labor performed shall be made at the rate of 92 percent of the amount invoiced through the Subcontractor's request for payment that shows the Work of the Subcontractor is 50 percent complete.

6.7.1.2 After the Work of the Subcontractor is 50 percent complete, as evidenced by payments of at least 50 percent of the total amount due under the Subcontract, no additional funds shall be retained from payments for labor.

6.7.2 Material Payments.

6.7.2.1 The Contractor shall pay the Subcontractor at the rate of 100 percent of the scheduled value for materials incorporated into the Project.

6.7.2.2 The Contractor shall pay the Subcontractor at the rate of 92 percent of the invoice cost, not to exceed the scheduled value, for materials delivered to the Site, or other off-site storage location approved by the A/E, provided the Subcontractor provides the following information with its request for payment:

- **.1** a list of the fabricated materials consigned to the Project, giving the place of storage, together with copies of invoices, in order to verify quantity and cost; and
- **.2** a certification of materials stored off-site, prepared by the Subcontractor and signed by the A/E to evidence that the materials are in conformity with the Specifications and have been tagged with the Project name and number for delivery to the Project. The Subcontractor shall reimburse the A/E, through the Contractor, for all costs incurred to visit a storage site, other than the areas adjacent to the Project.
- **.3** The Contractor shall pay the balance of the scheduled value when the materials are incorporated into and become a part of the Project.

6.8 Warranty. The Subcontractor fully warrants, for the benefit of the Public Authority, that all materials and equipment shall be new unless otherwise specified, of good quality, in conformance with the Contract Documents and free from defective workmanship or materials.

6.9 Non-Waiver of Lien Rights or Payment Bond Rights. This Subcontract shall not prohibit a Subcontractor from exercising its rights under ORC Chapter 1311 or under any Contractor-provided payment bond.

6.10 Non-Discrimination. The Subcontractor agrees to fully comply with Applicable Law regarding equal opportunity, including ORC Section 153.59 and, to the extent applicable, all Executive Orders issued by the Governor of the state of Ohio.

6.11 Dispute Resolution. The supplemental conditions to this Subcontract shall provide for a dispute resolution process comparable to the Contract's dispute resolution process in terms of timing, notice, substantiation, and informal dispute resolution efforts. The dispute resolution process provided in the supplemental conditions shall result in prompt access to the ultimate dispute resolution mechanism selected by the parties.

6.12 In the event that any supplemental conditions or other Subcontract terms conflict with the **State of Ohio Subcontract Form**, the **State of Ohio Subcontract Form** takes precedence and this Subcontract shall be read and enforced to include the provisions of the **State of Ohio Subcontract Form**.

6.13 The following exhibits are attached to and are a part of this Subcontract:

6.13.1 Exhibit A:

6.13.2 Exhibit B:

6.13.3 Exhibit C:

6.13.4 Exhibit D:

SIGNATURES

IN WITNESS WHEREOF, the parties have executed this Subcontract Form.

«INSERT SUBCONTRACTOR'S NAME»	«INSERT CONTRACTOR'S NAME»
Signature	*Signature*
Printed Name	*Printed Name*
Title	*Title*
	Date

END OF DOCUMENT

Document 00 61 13 - Performance and Payment Bond Form
State of Ohio Standard Requirements for Public Facility Construction

(Form of Bond prescribed by Ohio Revised Code Section 153.57 - Not to be used as Bid Guaranty)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____ _____, as Principal, and _____ as Sureties, are hereby held and firmly bound unto _____ _____ as Obligee(s), in the penal sum of _____ dollars, for the payment of which well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

SIGNED AND SEALED this _____ day of _____, _____.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named Principal did on the _____ day of _____, _____, enter into a Contract with the Obligee, which said Contract is made a part of this Bond the same as though set forth herein and which is more fully described as:

Project Number: _____

Project Name: _____

Contract Description: _____
(e.g., General Trades, Plumbing, HVAC, Electrical)

NOW, THEREFORE, if the above-named Principal shall well and faithfully do and perform the things agreed by the Obligee to be done and performed according to the terms of said Contract; and shall pay all lawful claims of Subcontractors, Material Suppliers, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said Contract; we agreeing and assenting that this undertaking shall be for the benefit of any Subcontractor, Material Supplier or laborer having a just claim as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Sureties for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of the said Contract or in or to the Plans and Specifications therefor shall in any wise affect the obligations of said Surety on its bond, and it does hereby waive notice of any such modifications, omissions or additions in or to the terms of the Contract, the Work or the Contract Documents, including without limitation the Plans and Specifications.

PRINCIPAL:

_____
Principal Signature

By: _____

Title: _____

SURETY:

_____
Surety Signature

By: _____
Attorney-in-Fact

SURETY INFORMATION:

_____
Street

_____
City State Zip

_____
Telephone Number

SURETY AGENT'S INFORMATION:

_____
Agency Name

_____
Street

_____
City State Zip

_____
Telephone Number

_____
Email Address

END OF DOCUMENT

Document 00 61 13.19 - Acknowledgement of Surety (General Contracting)
State of Ohio Standard Requirements for Public Facility Construction

Project Number: _____

Project Name: _____

Owner: _____

Contracting Authority: _____

Contractor: _____

Surety Name: _____

Performance & Payment Bond No.: _____

Original Penal Sum: _____

As required under the Contract between the State of Ohio, acting by and through the Contracting Authority, and the Contractor in connection with the Project, the Surety hereby acknowledges that the Penal Sum of the above-mentioned Bond has been increased to **$**_____ *(must be not less than 100% of the Contract Sum).*

SURETY:

_____
Surety Signature

By: _____
Attorney-in-Fact

_____
Date

SURETY INFORMATION:

_____
Street

_____
City State Zip

_____
Telephone Number

SURETY AGENT'S INFORMATION:

_____
Agency Name

_____
Street

_____
City State Zip

_____
Telephone Number

END OF DOCUMENT

Document 00 71 00 - Contracting Definitions (General Contracting Project)
State of Ohio Standard Requirements for Public Facility Construction

Acceptable Component A component listed in the Specifications after the Basis of Design Component.

Addenda or Addendum Written or graphic instrument issued prior to the bid opening which modifies or interprets the proposed Contract Documents by additions, deletions, clarifications, or corrections.

ADR See "Alternative Dispute Resolution."

A/E See "Architect/Engineer."

Agreement The form furnished by the Contracting Authority (including all of its exhibits) that, when completed and signed by the Contractor and Contracting Authority evidences entry into the Contract.

Allowance A sum stipulated in the Contract Documents for a defined scope of the Work that may not be completely defined at the time of bidding.

Alternate A potential change in the scope of the Work, which may include but is not limited to alternate materials or methods of construction, and an amount stated on the Bid form to be added to or deducted from the Base Bid if the corresponding Alternate is incorporated into the Contract.

Alternative Dispute Resolution A voluntary and non-binding process for the administrative review, consideration, and attempted settlement of a dispute, without resort to judicial process, including but not limited to partnering, negotiation, mediation, impartial fact-finding, dispute review board, and mini-trials, but shall not include arbitration.

Applicable Law All federal, state, and local codes, statutes, ordinances, and regulations that apply to the performance of the Work or the A/E's Services on the Project.

Architect/Engineer The Person responsible for providing professional design services and construction contract administration for the Project as provided in the Contract Documents. The A/E shall be a **(1)** registered architect holding a license and certificate of authorization issued by the Ohio Architects Board pursuant to ORC Chapter 4703, **(2)** landscape architect holding a license and certificate of authorization issued by the Ohio Landscape Architects Board pursuant to ORC Chapter 4703, or **(3)** professional engineer or professional surveyor holding a license and certificate of authorization issued by the Ohio Engineers and Surveyors Board pursuant to ORC Chapter 4733.

As-Built Documents Documents, including but not limited to Drawings, Addenda, Specifications, Modifications, and other elements of the Contract Documents which the Contractor annotates and otherwise modifies to indicate changes made during the construction process, the location of concealed and buried items, and other information useful to the Owner throughout the life of the completed Project.

Base Bid The amount stated in a Bid as the sum for which the Bidder offers to perform the Work in a particular trade or other category, which is described in the Contract Documents, excluding Alternates.

Basis of Design A document that records the concepts, calculations, decisions, and product selections used to meet the Owner's Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

Basis of Design Component A component listed first in the Specifications.

Bid A written proposal to perform a Contract, submitted on a completed Bid Form, accompanied by other required documents. The term Bid includes a proposal that has been digitally signed, encrypted, and submitted through the State's electronic bidding application pursuant to OAC Section 153:1-8-01.

Bidder A Person that submitted a Bid.

Bidding Documents The advertisement or invitation to bid; instructions to bidders; Bid Guaranty; Bid Form with any supplements; and the proposed Contract Documents (including all Addenda).

Bid Form A form furnished by the Contracting Authority with the proposed Contract Documents that are to be completed, signed, and submitted containing the Bidder's Bid.

Bid Guaranty A bid bond or other instrument of security authorized by ORC Section 153.54 submitted with the Bid to provide assurance that the Bidder will execute the Agreement.

BIM See "Building Information Model."

Bond A performance and payment bond in the format specified by ORC Section 153.57 submitted by the Contractor to provide assurance that the Contractor will perform the Work of the Contract, including making required payments to Subcontractors and Materials Suppliers.

Building Information Model A digital representation of physical and functional characteristics of a facility; a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle, which is defined as existing from earliest conception to demolition; electronic files used to design and coordinate the Project; and may be used to describe a single model or multiple models used in the aggregate.

Certificate of Contract Completion A form used to document that the Contractor's achievement of Contract Completion. This form may also be used to document partial Contract Completion.

Certificate of Substantial Completion A form used to document **(1)** that the Contractor has achieved Substantial Completion of the Work or a designated portion of the Work for which the Contracting Authority and the Owner have agreed to take Partial Occupancy, and **(2)** the date on which the associated Substantial Completion of the Work was achieved.

Change Directive A written order prepared by the A/E and executed by the Contracting Authority and Owner that directs a change in the Work or the performance of disputed Work as described in the General Conditions.

Change Order A document recommended by the A/E and executed by the Contracting Authority, Owner, and Contractor that modifies the Contract.

Change Request A written request from the Contractor accompanied by a Proposal seeking an adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract.

Claim A demand or assertion, initiated by written notice, certified by one of the parties to the Contract seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract.

Commission See "Ohio Facilities Construction Commission."

Commissioning Agent The Person identified by the Contracting Authority who leads, plans, schedules, and coordinates the commissioning team to implement the Commissioning Process for the Project.

Commissioning Plan A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the Commissioning Process.

Commissioning Process A quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all of its systems are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements

Commissioning Report A document that records the activities and results of the Commissioning Process. The Commissioning Report is developed from the final Commissioning Plan with its attached appendices.

Conformed Documents Contract Documents with all Addenda items and accepted Alternates incorporated by the A/E, published, and issued to a successful Bidder for its use during performance of the Contract. The Conformed Documents are furnished solely for the Contractor's convenience. In the event of any conflict between the Contract Documents modified by Addenda and the Conformed Documents, the Contract Documents take precedence.

Construction Budget The budget for Construction Cost.

Construction Cost The total cost for the Contractor's performance of the Work including all elements of the Project designed or specified by the A/E (at current market rates of labor and materials). Construction Cost does not include the following: A/E fees, the cost of the land, right-of-way acquisition costs, financing costs, or Owner's contingencies.

Construction Progress Schedule The critical path schedule for performance of the Contract; showing the time for completing the Work within the Contract Times; the planned sequence for performing the various components of the Work; the interrelationship between the activities of the Contractor, Subcontractors, A/E, Contracting Authority, and Owner; and the Contractor's resource and cost loading information; as periodically updated during the performance of the Work.

Contract The state of legal obligation entered into by the State and the Contractor, whereby they have agreed to an exchange of certain acts, materials, equipment, and services for certain monetary consideration, under all terms and conditions specified in the Contract Documents, which shall remain in full force and effect until such time as all obligations under the Contract have been lawfully and completely discharged, or the Contract is terminated under other conditions specified in the Contract Documents

Contract Completion The stage in the progress of the Work when the Work is completed in accordance with the terms of the Contract Documents including but not limited to **(1)** all governmental authorities have given final, written approval of the Work, **(2)** a final unconditional certificate of occupancy has been granted or certificate of completion (as appropriate) and issued to the Owner by the appropriate governmental authorities, **(3)** the Contractor's Work is 100 percent complete, and **(4)** all Punch List items have been completed or corrected, and **(5)** the Contractor has complied with conditions precedent to final payment and release of retained funds. Contract Completion may apply to a single Phase of a multi-Phase Project without applying to one or more other Phases of the same Project or to the Project as a whole.

Contract Documents Collectively, the documents that constitute the substance of the Contract including Drawings, Specifications, Addenda if any, Project Manual, General Conditions, Supplementary Conditions if any, Bid Form, Wage Rate Requirements; and the executed Agreement, Bid Guaranty and Contract Bond, and Modifications if any. Notwithstanding the foregoing sentence, the Contract Documents do not include the advertisement or invitation to bid, instructions to bidders, sample forms, other procurement-related documents or information furnished by the Contracting Authority or Owner in anticipation of receiving Bids, the Contractor's Bid, or portions of Addenda relating to bidding requirements except to the extent specifically incorporated into the Contract Documents.

Contract Sum The amount stipulated as such in the Agreement. The Contract Sum is the Contractor's entire compensation for the Contractor's proper, timely, and complete performance of the Work and is subject to adjustment as provided in the Contract.

Contract Times The periods stipulated in the Agreement for the achievement of associated Milestones, in consecutive days, beginning on the Date of Commencement established by the Notice to Proceed, including adjustments as provided in the Contract.

Contracting Authority The party identified as such in the Agreement, which may be the Ohio Facilities Construction Commission; an agency of the state of Ohio; an Institution of Higher Education or division thereof; a School District Board; or the legislative body of a political subdivision.

Contractor The party identified as such in the Agreement. If the Contractor is a joint venture or special purpose entity, each joint venturer and each member (as applicable) is individually, jointly, and severally obligated under the Contract.

Contractor's Documents All Project-related documents, including those in electronic form, prepared by the Contractor and its Subcontractors.

Contractor's Fee The portion of the Contract Sum attributable to the aggregate of the Contractor's Overhead and profit related to the Contractor's proper, timely, and complete performance of the Work.

Contractor Payment Request The form furnished by the Commission that is to be used by the Contractor in requesting payments and which, when submitted by the Contractor, shall serve as an affidavit that payments requested are in proportion to the Work completed as shown on the Schedule of Values.

Contractor's Punch List A document prepared by the Contractor that consists of a list of items of Work to be completed or corrected by the Contactor as a condition precedent to Contract Completion.

Coordination Drawings Drawings and Electronic Files prepared by the Contractor and Subcontractors to demonstrate how multiple-system and interdisciplinary work will be coordinated. Clash reports generated by BIM authoring software may be included in the Coordination Drawing submittals if applicable.

Correction Period A period of one year commencing on the date of Substantial Completion of the Work or a designated portion of the Work which the Contracting Authority and Owner have agreed to take Partial Occupancy.

CxA See "Commissioning Agent."

Date of Commencement The date established in a Notice to Proceed issued by the Contracting Authority to the Contractor to mark the start of the Work and the beginning of the running of the Contract Times.

day A calendar day of 24 hours measured from midnight to midnight, unless otherwise expressly specified to mean a business day.

Defective Work Work that does not conform to the Contract Documents; or does not meet the requirements of any applicable statute, rule or regulation, inspection, reference standard, test, or approval; or has been damaged prior to the A/E's recommendation of final payment, unless responsibility for the protection thereof has been expressly assumed by the Owner; or that is not free from defects in workmanship, materials, or equipment during the period of any warranty or guarantee.

Delegated Design A form of collaboration between the A/E and the Contractor whereby **(1)** the A/E defines the performance and design criteria for specifically identified systems, materials, equipment, or details included in the Work; and **(2)** the Contractor provides the detailed design of those identified systems, materials, equipment, or details; which responsibility may require the Contractor to engage a licensed design professional to perform the related services. The items and scope of Delegated Design included in the Work are subject to the Contracting Authority's approval and may include, but is not limited to, structural steel elements and connections, precast concrete systems, curtain wall systems, metal panel facades, waterproofing systems, roofing systems, mechanical systems, and fire protection systems.

Differing Site Condition Either **(1)** a subsurface or otherwise concealed physical condition encountered at the Site that differs materially from the conditions indicated in the Contract Documents or **(2)** an unknown physical condition of an unusual nature encountered at the Site that differs materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents.

Drawings Graphic portions of the Contract Documents showing the design, type of construction, location, dimension, and character of the Work to be provided by the Contractor, which generally includes plans, elevations, sections, details, schedules, diagrams, notes, and text.

Electronic File Information maintained in a computer system or format that is intended to facilitate a Person's use and manipulation of the information including but not limited to Word, Excel, PDF, Primavera, CAD, and BIM files all in their native format.

Enclosure, Permanent The condition in which the permanent exterior walls and roofs are in place, insulated and weathertight, and permanent windows and entrances are in place.

Enclosure, Temporary The condition in which the permanent exterior walls and roofs are in place, insulated and weathertight, and windows and entrances are provided with suitable temporary enclosures.

Estimated Construction Cost The sum of the estimated Construction Cost amount(s) (including Base Bid and Alternates) published in the bidding documents, as modified by Addenda, for a Phase of the Project.

Extra Materials Materials required by the Contract Documents that are not incorporated into the Project but are given to the Owner to be used for future maintenance or repairs.

Fee See "Contractor's Fee."

Field Meeting A meeting between the Contracting Authority, Owner, and Contractor to review and endeavor to resolve a Change Directive, Change Request, or other matter.

Final Inspection The final review of the Work by the A/E to determine whether issuance of the Certificate of Contract Completion is appropriate.

furnish Supply and deliver to the Site, or other specified location, ready for installation.

General Conditions The State's Standard General Conditions in effect as of the date of the Agreement.

General Conditions Costs General Conditions Costs include only the Contractor's costs to provide the general conditions Work including without limitation the costs of all of the following Site-related items: scheduling and coordinating the Work. telephone, telephone charges, facsimile, telegrams, postage, photos, photocopying, hand tools, simple scaffolds (one level high), tool breakage, tool repairs, tool replacement, tool blades, tool bits, and pre-approved travel, lodging, and parking costs. General Conditions Costs also include **(1)** Bond premiums; **(2)** premiums for subcontractor default insurance to the extent incurred on account of Subcontractors enrolled for the Project; and **(3)** premiums for builder's risk insurance if the Contractor is required to provide the builder's risk insurance described in the General Conditions (premiums for "difference in conditions" insurance coverage are included in Overhead and are not included in General Conditions Costs).

Hazardous Materials Any material, substance, pollutant, or contaminant that is defined, regulated, referenced, or classified in the Comprehensive Environmental Response, Compensation and Liability Act, Federal Water Pollution Control Act, the Resource Conservation and Recovery Act, Clean Air Act, Hazardous Materials Transportation Uniform Safety Act, Toxic Substances Control Act, or any other Applicable Law relating to any hazardous, toxic, or dangerous waste, substance, or material. Any substance or material that, after release into the environment or upon exposure, ingestion, inhalation, or assimilation, either directly from the environment or directly by ingestion through food chains, will, or may reasonably be anticipated to, cause death, disease, behavior abnormalities, cancer or genetic abnormalities and specifically includes but is not limited to asbestos, polychlorinated biphenyls ("PCBs"), radioactive materials, including radon and naturally occurring radio nuclides, natural gas, natural gas liquids, liquefied natural gas, synthetic gas, oil, petroleum and petroleum-based derivatives and urea formaldehyde.

Indemnified Parties The State, Contracting Authority, Owner, A/E, other Separate Consultants, and their respective officials, officers, consultants, agents, representatives, and employees, in both individual and official capacities.

install Put into use or place in final position, complete and ready for intended service or use.

Institutional Designee The party identified in the Agreement empowered with a level of authority similar to the Executive Director of the Commission, which may be the university architect or engineer, director of capital facilities, or an institution vice president.

Institution of Higher Education Any state institution of higher education as defined in ORC Section 3345.011, including any state university or college, community college, state community college, technical college, university branch, community college district, technical college district, university branch district, and the applicable board of trustees or, in the case of a university branch district, any other managing authority.

Legal Holiday Legal Holidays are as follows: **(1)** New Year's Day – First Day in January; **(2)** Martin Luther King Jr. Day – Third Monday in January; **(3)** Washington-Lincoln (President's) Day – Third Monday in February; **(4)** Memorial Day – Last Monday in May; **(5)** Juneteenth National Independence Day (Juneteenth) – Nineteenth day of June; **(6)** Independence Day – Fourth day of July; **(7)** Labor Day – First Monday in September; **(8)** Columbus Day – Second Monday in October; **(9)** Veterans' Day – Eleventh Day of November; **(10)** Thanksgiving Day – Fourth Thursday of November; and **(11)** Christmas Day – Twenty-fifth day of December. If a Legal Holiday falls on a Saturday, it is observed on the preceding Friday. If a Legal Holiday falls on a Sunday, it is observed on the following Monday.

Liquidated Damages	A sum established in the Contract Documents, pursuant to the statutory delay forfeiture authorized under ORC Section 153.19, to be paid to the Owner due to the Contractor's failure to complete the Work within the Contract Time for achievement of Substantial Completion, or any applicable portion of the Work on or prior to any Milestone date stated on the Agreement.
Material Supplier	A Person under a contract with the Contractor to furnish materials or supplies in furtherance of the Work, including all such Persons in any tier. Material Supplier does not include any Separate Contractor unless expressly assigned in writing to the Contractor by the Owner and accepted by the Contractor.
mediation	A voluntary process in which a neutral third party meets with the parties who have a disagreement or dispute and attempts to facilitate a mutually satisfactory resolution.
Milestone	A principal event specified in the Contract relating to a completion date or time.
Modification	A **(1)** written amendment to the Contract signed by both parties, **(2)** Change Order, **(3)** Change Directive, or **(4)** an order for a minor change in the Work.
negotiation	A form of Alternative Dispute Resolution in which all parties involved are represented by those invested with the authority to agree to a determination of an adjustment in the Contract Sum, Contract Times, or both.
Neutral Facilitator	A nonpartisan third-party without decision-making authority who is engaged to assist the Project's key stakeholders in developing cooperative relationships, achieving project objectives, avoiding or minimizing disputes, and nurturing a more-collaborative ethic characterized by trust, cooperation, and teamwork.
Notice of Commencement	A notice prepared by the Contracting Authority identifying the Project, the Contractors, the Surety for each Contractor, and the name of the Contracting Authority's representative upon whom a claim affidavit may be served.
Notice of Intent to Award	A written notice provided by the Contracting Authority to the apparent successful Bidder stating that upon satisfactory compliance with all conditions precedent for execution of a Contract within the time specified, the Contracting Authority intends to execute a Contract with the Bidder.
Notice to Proceed	A written notice provided by the Contracting Authority to the Contractor to establish the Date of Commencement and to authorize the Contactor to proceed with the Work.
OAC	Ohio Administrative Code
Ohio Facilities Construction Commission	The authorized contracting agent for public improvement projects in accordance with ORC Chapters 123 and 153, acting by and through its Executive Director.
ORC	Ohio Revised Code.

Overhead The term "Overhead" includes all of the following costs: **(1)** home-office payroll, which includes: payroll costs and all other compensation (including without limitation membership in trade, business, or professional organizations; professional licenses; training; and bonuses or similar plans/arrangements related to performance on, or profit from, the Project) of the Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by the Contractor in the Contractor's principal or a branch office (not including the Contractor's Site office) for general administration of the Work; **(2)** home-office expenses, which include (except where specifically allowed as a General Conditions Cost): all expenses of the Contractor's principal and branch offices including without limitation home-office telephone, telephone charges, computers, fax, postage, photos, copies, legal services, and accounting services; **(3)** all of the Contractor's capital expenses, including without limitation interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments; **(4)** all costs due to the negligence or breach of contract of the Contractor, a Subcontractor, or anyone for whom they may be liable, including without limitation the correction of Defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property; **(5)** all costs related to insurance provided by the Contractor, whether required under the Contract or not, except **(a)** premiums for subcontractor default insurance in the Construction Stage if those insurance premiums are included as a General Conditions Cost and **(b)** premiums for builder's risk insurance if the Contractor is required to provide the builder's risk insurance described in the General Conditions (premiums for "difference in conditions" insurance coverage are included in Overhead); **(6)** all travel, lodging, and parking costs, except where specifically allowed as a pre-approved General Conditions Cost; **(7)** all applicable taxes of every kind (including but not limited to commercial activity tax ("CAT")) except where otherwise specifically allowed; **(8)** all other overhead or general administrative expenses of any kind and any cost not specifically allowed as a separately recoverable cost of the Work in the Construction Stage.

Owner The state of Ohio agency, Institution of Higher Education or division thereof, School District Board, or other instrumentality for whom the Project is being constructed.

Owner's Project Requirements A written document that details the functional requirements of the Project and the expectations of how it will be used and operated. These requirements include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

Partial Occupancy The condition that occurs when the Owner occupies or uses a portion of the Project prior to Contract Completion, partial occupancy is approved by authorities with jurisdiction over the Project and the insurer(s) providing the builders risk insurance, and items of Work cannot be completed until a subsequent date.

partnering A voluntary dispute prevention process involving team building activities to help define common goals, improve communication, and foster a problem-solving attitude among a group of contracting parties that must work together throughout Contract performance to be less adversarial and more cooperative.

Payment Request See "Contractor Payment Request."

Person An individual, corporation, business trust, estate, partnership, association, or other public or private entity.

Phase A separation in the Work of the Project by sequence or time intervals, as defined in the Agreement (e.g., in a multiple-site or multiple-building Project, each site or building may be identified as a separate "Phase"). Each Phase may include different Subcontractors.

Product Data Manufacturer's standard illustrations, schedules, diagrams, performance charts, instructions, and brochures that illustrate physical appearance, size, and other characteristics of materials and equipment.

Progress Status Report A monthly progress report prepared by the Contractor and containing the following information for each Phase of the Work: **(1)** the updated Construction Progress Schedule; **(2)** progress photos; **(3)** an executive summary; **(4)** a discussion of pending items and existing or anticipated problems and status of RFIs; **(5)** a safety and accident report; **(6)** information on each Subcontractor and each Subcontractor's work as well as the entire Work, showing percentages of completion and the number and amounts of Change Orders and Change Directives and relating such information to the Construction Progress Schedule and the Contract Sum; **(7)** a list of all identified Claims, any threatened claims and issues that, in the reasonable judgment of Contractor, may potentially become Claims and any potential Change Orders that have been submitted to the Owner by the Contractor; **(8)** information on compliance with the EDGE participation goals established for the Project; **(9)** status of compliance with required LEED components, if applicable; and **(10)** such other relevant information as may be reasonably required by the Owner from time to time.

Project The public improvement, of which the Work performed under the Contract Documents may be the whole or a part.

Project Manager A permanent employee of the Contracting Authority assigned to the Project and authorized to perform specific responsibilities.

Project Manual That part of Contract Documents which consists of bound volume(s) of primarily written material which generally contain Division 00 - "Procurement and Contracting Requirements," and Divisions 01 through 49 - "Specifications," and other documents pertaining to the Project.

Proposal The offer of a Contractor to perform the Work set forth in a Change Request or Proposal Request.

Proposal Request A document issued after execution of the Contract requesting a Proposal from the Contractor(s), which may initiate a Change Order to modify the Contract.

provide Furnish and install, complete and ready for intended use.

Punch List A document listing items of Work requiring correction or completion by the Contractor as a condition precedent to Contract Completion.

Punch List Milestone The date 30 days after the achievement of Substantial Completion of all or a portion of the Work.

Record Documents Electronic files and printed documents of all nature prepared by the A/E, which incorporate the information shown on the Contractor's As-Built Documents. They consist of the "Record Drawings" and "Record Project Manual," Certificate of Substantial Completion, Certificate of Contract Completion (as complete), manufacturers' warranties, certificate(s) of occupancy or completion (as appropriate), approved shop drawings and other action submittals, responses to Requests for Information, Addenda, Modifications, balancing reports, and the final version of the approved Construction Progress Schedule.

Record Drawings The Drawings, which have been revised by the A/E to show the changes made during the construction process, conformed to represent the Work as executed by the Contractor.

Record Model The Building Information Model, which has been revised by the A/E to show the changes made during the construction process, conformed to represent the Work as executed by the Contractor.

Record Project Manual The Project Manual of the Contract Documents, which has been revised by the A/E to show the changes made during the construction process, based on the As-Built Project Manual furnished by the Contractor.

Request for Information A written request to the A/E seeking an interpretation or clarification of the Contract Documents.

RFI See "Request for Information."

Samples Physical examples, color selection items, field samples, and mock-ups furnished by the Contractor to illustrate functional and aesthetic characteristics of products, materials, equipment, or workmanship and establish criteria by which the Work shall be judged.

Schedule of Values A full, accurate, and detailed statement furnished by the Contractor reflecting a defined breakdown of the Contract Sum.

School District A local, exempted village, or city school district as defined in ORC Chapter 3311, or a joint vocational school established pursuant to ORC Section 3311.18, performing essential governmental functions of state government pursuant to ORC Sections 3318.01 to 3318.20.

School District Board The board of education of a School District.

Separate Consultant. A Person engaged by the Owner or Contracting Authority to provide Project-related professional services other than the services under this Contract. The term includes the Separate Consultant's authorized representatives, successors, assigns, and subconsultants regardless of tier.

Separate Contract The contract between the Owner or Contracting Authority and a Separate Consultant or a Separate Contractor.

Separate Contractor A Person under contract with the Owner or Contracting Authority to provide Project-related work other than the Work under this Contract. The term includes the Separate Contractor's authorized representatives, successors, assigns, and subcontractors regardless of tier.

Shop Drawings Drawings, diagrams, illustrations, and schedules specifically prepared for the Project provided by the Contractor or a Subcontractor to illustrate some portion of the Work. Shop Drawings are not Contract Documents.

Site The location designated for the Project.

Specifications Those portions of the Contract Documents consisting of detailed written administrative, procedural, and technical requirements, included in Divisions 01 through 49, for the construction of the Work, whether physically on the Drawings or bound in separate volumes, including identification of acceptable materials, methods, equipment, quality, and workmanship.

Stage A distinct period in the life cycle of a facility from concept through construction, to use and deconstruction or demolition. Typical Stages include Program Verification, Schematic Design, Design Development, Construction Documents, Bidding and Award stages; and the Construction Stage, which includes Construction and Closeout activities.

Standard Requirements The brief name of the "State of Ohio Standard Requirements for Public Facility Construction," including but not limited to General Conditions, and other Division 00 Documents and Division 01 Sections; in effect as of date of the Agreement.

State The government of Ohio, including any organized body, office, or agency established by the laws of this state for the exercise of any function of state government, or any state institution of higher education as defined in ORC Section 3345.011.

Subcontract Any contract or agreement between the Contractor and a Subcontractor for performance of a portion of the Work.

Subcontract Form The **State of Ohio Subcontract Form** prescribed by OAC Section 153:1-3-02 and required for use with the General Contracting method of project delivery.

Subcontractor A Person who undertakes to perform any part of the Work on the Project under a contract with a Contractor or with any Person other than the State, including all such Persons in any tier. The term "Subcontractor" includes Material Suppliers, but does not include any Separate Contractor unless expressly assigned in writing to the Contractor by the Owner and accepted by the Contractor.

Substantial Completion The stage in the progress of the Work when the Work (or designated portion of the Work for which the Contracting Authority and Owner have agreed to take Partial Occupancy) is sufficiently complete in accordance with the Contract that the Owner can utilize the Work for its intended use, as determined by the A/E. The issuance of a certificate of occupancy, partial certificate of occupancy, certificate of completion, or partial certificate of completion (as applicable) to the Owner by the appropriate governmental authorities is a condition precedent to the achievement of Substantial Completion.

Substantially Complete See “Substantial Completion.”

Substitution An article, device, material, equipment, form of construction, or other item, proposed by a prospective Bidder prior to the bid opening and approved by the A/E by Addendum, for incorporation or use in the Work as being functionally and qualitatively equivalent to essential attributes of a Basis of Design or Acceptable Component specified in the proposed Contract Documents.

Supplementary Conditions Amendments to the General Conditions, issued as a separate document, which describe conditions of the Contract unique to a particular Owner or Project, which may include provisions regarding the assignment of responsibility for refuse removal, safety and security precautions and programs, temporary Project facilities and utilities, weather and fire protection, scaffolding and equipment, materials and services to be used commonly by the Contractor and Subcontractors and requiring the Contractor to provide assistance in the utilization of any applicable equipment system, preparation of operation and maintenance manuals, and training of Owner personnel for operation and maintenance of the Project. The General Conditions shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Conditions prepared by the Contracting Authority and approved by the Commission.

Supplementary Instructions Amendments to the Instructions to Bidders, issued as a separate document, which describe instructions unique to a particular Owner or Project. The Instructions to Bidders shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Instructions prepared by the Contracting Authority and approved by the Commission.

Surety A Person providing a Bid Guaranty or a Bond to a Bidder or a Contractor, as applicable.

Systems Manual A system focused composite document that includes the operation manual, maintenance manual, and additional information of use to the Owner after they begin using the facility.

Unit Price The cost of providing a unit of Work including labor, materials, services, and associated expenses. Unit Prices include the Contractor’s Fee on account of the associated Unit Price Work.

Work The labor, materials, equipment, and services, individually or collectively which are required by the Contract Documents, to be performed or provided by the Contractor for the Project. The furnishing of all material, labor, detailing, layout, supplies, plants, tools, scaffolding, transportation, temporary construction, superintendence, demolition, and all other services, facilities and items reasonably necessary for the full and proper performance and completion of the requirements of the Project as set forth in the Contract Documents, and items reasonably inferable therefrom and consistent therewith for the proper execution and completion of the construction and other services required by the Contract Documents, whether provided or to be provided by the Contractor or a Subcontractor, or any other entity for whom the Contractor is responsible, and whether or not performed or located on or off of the Site.

Work Day Any day **(1)** that is not a Sunday or Legal Holiday (except as further provided in this paragraph); and **(2)** on which the Contractor performs Work or intends to perform Work as evidenced by the contemporaneous Construction Progress Schedule. Sundays and Legal Holidays are not Work Days unless **(1)** identified as such in the contemporaneous Construction Progress Schedule or **(2)** the Contractor provides 48-hours' advance notice to the Owner scheduling those days as Work Days.

END OF DOCUMENT

Document 00 72 13 - General Conditions (General Contracting Project)
State of Ohio Standard Requirements for Public Facility Construction

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ARTICLE 1 - CONTRACTOR'S RESPONSIBILITIES

1.1 Nondiscrimination

1.1.1 The Contractor shall comply with Applicable Law regarding equal employment opportunity, including ORC Section 153.59 and all Executive Orders issued by the Governor of the state of Ohio.

1.1.1.1 As required under ORC Section 153.59, the Contractor agrees to both of the following:

.1 "in the hiring of employees for the performance of work under the contract or any subcontract, no contractor, subcontractor, or any person acting on a contractor's or subcontractor's behalf, by reason of race, creed, sex, disability or military status as defined in section 4112.01 of the Revised Code, or color, shall discriminate against any citizen of the state in the employment of labor or workers who is qualified and available to perform the work to which the employment relates;" and

.2 "no contractor, subcontractor, or any person on a contractor's or subcontractor's behalf, in any manner, shall discriminate against or intimidate any employee hired for the performance of work under the contract on account of race, creed, sex, disability or military status as defined in section 4112.01 of the Revised Code, or color."

1.1.1.2 The Contractor shall cooperate fully with the State's Equal Opportunity Coordinator ("EOC"), with any other official or agency of the state or federal government that seeks to eliminate unlawful employment discrimination, and with all other state and federal efforts to assure equal employment practices under the Contract.

1.1.1.3 In the event the Contractor fails to comply with these nondiscrimination clauses, the Contracting Authority shall deduct from the amount payable to the Contractor a forfeiture of the statutory penalty pursuant to ORC 153.60 for each person who is discriminated against or intimidated in violation of this **Section 1.1.1**.

1.1.1.4 The Contract may be terminated or suspended in whole or in part by the Contracting Authority and all money to become due hereunder may be forfeited in the event of a subsequent violation of this **Section 1.1.1**.

1.1.2 Hiring Under State Public Improvement Contracts.

1.1.2.1 Any provision of a hiring hall contract or agreement which obligates the Contractor to hire, if available, only employees referred to the Contractor by a labor organization shall be void as against public policy and unenforceable with respect to employment under any public improvement contract unless at the date of execution of the hiring hall contract or agreement, or within 30 days thereafter, the labor organization has procedures in effect for referring qualified employees for hire without regard to race, color, religion, national origin, military status as defined in ORC Section 4112.01, or ancestry and unless the labor organization includes in its apprentice and

journeyman's membership, or otherwise has available for job referral without discrimination, qualified employees, both whites and non-whites (including African-Americans).

1.2 Prevailing Wages

1.2.1 The Contractor shall comply with the prevailing wage requirements described under ORC Chapter 4115 that include, without limitation, the requirements described under this **Section 1.2**.

1.2.2 If the Project is subject to payment of prevailing wage rates, the Contractor shall:

1.2.2.1 pay to laborers and mechanics performing Work on the Project the prevailing wage rates of the Project locality, as determined by the Ohio Department of Commerce, Wage and Hour Bureau;

1.2.2.2 post in a prominent place readily accessible by all workers on the Site, a legible listing of the current classifications of laborers, workers, and mechanics employed under this Contract;

1.2.2.3 ensure that the rates posted are current and remain posted in legible condition during the period of the Contract; and

1.2.2.4 not be entitled to an increase in the Contract Sum on account of an increase in prevailing wage rates, except as otherwise provided by Applicable Law.

1.2.3 The Contractor may access the Ohio Department of Commerce, Wage & Hour Bureau at its website, http://198.234.41.198/w3/webwh.nsf/pages/PrevailingWageBid, to obtain the current wage rates.

1.3 Royalties and Patents

1.3.1 The Contractor shall pay all royalties and license fees and assume all costs incident to the use, in the performance of the Work or the incorporation in the Work, of any invention, design, process, product, or device that is the subject of patent rights or copyrights held by others.

1.3.2 If the Contractor has reason to believe that use of the specified item is subject to patent or copyright protection, the Contractor shall immediately notify the Contracting Authority.

1.4 Assignment of Antitrust Claims

1.4.1 By signing the Agreement, the Contractor assigns, conveys and transfers to the Contracting Authority any right, title, and interest to any claims or causes of action it may have or acquire under state or federal antitrust laws relating to any goods, products, or services purchased, procured, or rendered to the State pursuant to the Contract.

1.5 Use of Domestic Steel

1.5.1 The Contractor is required by law to supply domestically produced steel products used for load bearing structural purposes on all projects funded in whole or in part with State funds.

1.5.2 The Contractor and Subcontractors shall comply with ORC Section 153.011 regarding the use of domestically produced steel products for load bearing structural purposes on all projects funded in whole or in part with State funds. Copies of ORC Section 153.011 may be obtained from the Ohio Facilities Construction Commission or downloaded at http://codes.ohio.gov/orc/153.011v1.

1.6 Drug Free Safety Program Participation

1.6.1 Throughout the performance of the Work, the Contractor shall be enrolled in and remain in good standing in the Ohio Bureau of Workers' Compensation ("OBWC") Drug-Free Safety Program ("DFSP") or a comparable program approved by the OBWC that meets the requirements specified in ORC Section 153.03 ("OBWC-approved DFSP").

1.6.2 As required under ORC Section 153.03(E):

1.6.2.1 "Each contractor shall require all subcontractors with whom the contractor is in contract for the public improvement to be enrolled in and be in good standing in the Bureau of Workers' Compensation's Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to a subcontractor providing labor at the project site of the public improvement."

1.6.2.2 "Each subcontractor shall require all lower-tier subcontractors with whom the subcontractor is in contract for the public improvement to be enrolled in and be in good standing in the Bureau of Workers' Compensation's Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in

section 153.03 of the Revised Code prior to a lower-tier subcontractor providing labor at the project site of the public improvement."

1.6.2.3 "Failure of a contractor to require a subcontractor to be enrolled in and be in good standing in the Bureau of Workers' Compensation's Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to the time that the subcontractor provides labor at the project site will result in the contractor being found in breach of the contract and that breach shall be used in the responsibility analysis of that contractor or the subcontractor who was not enrolled in a program for future contracts with the State for five years after the date of the breach."

1.6.2.4 "Failure of a subcontractor to require a lower-tier subcontractor to be enrolled in and be in good standing in the Bureau of Workers' Compensation's Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to the time that the lower-tier subcontractor provides labor at the project site will result in the subcontractor being found in breach of the contract and that breach shall be used in the responsibility analysis of that subcontractor or the lower-tier subcontractor who was not enrolled in a program for future contracts with the State for five years after the date of the breach."

1.6.3 Prior to authorizing a Subcontractor to commence Work on the Site, the Contractor shall obtain the Contracting Authority's approval, and shall also submit to the A/E written confirmation of the Subcontractor's enrollment on the **Subcontractor and Material Supplier Declaration** form.

1.6.4 In addition to OBWC-approved DFSP Basic requirements, the Contractor, each Subcontractor, and each Separate Contractor that provides labor on the Site shall participate in a pool that performs random drug testing of at least five percent of its employees who perform labor on the Site. The random drug testing percentage shall also include the on-site supervisors of the Contractor, Subcontractors, and Separate Contractors. Basic random drug testing shall otherwise comply with the same testing guidelines and criteria as required for OBWC-approved advanced testing. The Contractor and Subcontractor shall provide evidence of required testing to the Contracting Authority upon request.

1.7 Use of Project Management Software

1.7.1 If the Contracting Authority decides, in its sole discretion, to use project management software for the Project, the Contractor shall use that software for all compatible services required under this Contract.

1.7.2 All costs for the Contractor's use of the project management software for the Project shall be included in the Contract Sum. If the Contractor is unfamiliar with the proper use of the software, the Contractor shall provide its employees for training without additional compensation.

1.8 EDGE Participation and Reporting

1.8.1 The Contractor shall participate in the "Encouraging Diversity, Growth and Equity" ("EDGE") Program by subcontracting with, and using one or more, businesses certified as an EDGE Business Enterprise ("EDGE-certified Business") by the Ohio Department of Development.

1.8.1.1 If the Contractor is an EDGE-certified Business, the Contractor may include its own compensation under this Contract in the reporting.

1.8.1.2 The amount of EDGE participation cannot exceed 100 percent of the Contract Sum.

1.8.1.3 The Contractor shall include in the reporting only those expenditures to EDGE-certified Businesses that perform a commercially useful function as described in the OAC.

1.8.2 The Contractor shall provide an EDGE Participation Report with each Contractor Payment Request.

1.8.2.1 The Contractor shall provide status reports, produced by the Contractor and each applicable EDGE-certified Business for the Contract, indicating:

- **.1** the name of each EDGE-certified Business;
- **.2** the federal tax identification number of each EDGE-certified Business;
- **.3** the date of the EDGE-certified Business contract, Subcontract, or purchase order;
- **.4** the projected and actual start and end dates of the EDGE-certified Business contract, Subcontract, or purchase order;
- **.5** the original amount of the EDGE-certified Business contract, Subcontract, or purchase order with the Contractor;
- **.6** the current amount of the EDGE-certified Business contract, Subcontract, or purchase order;

.7 the amount invoiced to date;

.8 the amount paid to date;

.9 the status of the EDGE-certified Business contract, Subcontract, or purchase order (active, complete, or void); and

.10 a statement describing any substantive product or performance deficiencies.

1.8.2.2 The Contractor shall provide reports for each EDGE-certified Business; however, the reports may be consolidated and submitted as one document.

1.8.3 The Contractor shall provide an EDGE Participation Final Report simultaneously with its final Contractor Payment Request.

1.8.3.1 The Contractor and each EDGE-certified Business shall provide in the report certification that the submitted document is a true and accurate accounting of the original contract amount paid to and, received by each EDGE-certified Business.

1.8.4 The Contractor shall provide the EDGE Participation Reports in detail and form acceptable to the Contracting Authority.

1.8.4.1 Failure to timely submit EDGE Participation Reports may result in withholding payment in accordance with **Section 9.8**.

1.8.5 The Contractor shall cooperate fully with requests for additional EDGE information and documentation from the Ohio Department of Development or Contracting Authority.

1.9 Owner Work Rules

1.9.1 The Contractor shall consult with the Owner to obtain full knowledge of the Owner's rules, regulations, or requirements affecting the Project.

1.10 Emergency

1.10.1 In the event of an emergency affecting the safety of the Project, other property, or individuals, the Contractor, without special instruction or authorization, shall act to prevent the threatened damage, injury, or loss.

1.10.2 If the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of its actions in response to an emergency, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6**; and **(2)** within the time period required under **Section 7.6**, which begins to run on the day that the emergency began.

1.11 Contractor's Standard of Care

1.11.1 The Contractor shall perform the Work in a workmanlike manner, consistent with the standards of skill and care exercised by entities licensed to perform (where required under Applicable Law) and regularly performing comparable work in the same or similar locality under the same or similar circumstances.

1.12 Limit of Contractor's Responsibility

1.12.1 The Contractor is not responsible for the A/E's negligence or the A/E's failure to properly perform the A/E's contract.

1.13 Sustainability Requirements

1.13.1 This Project shall be designed and constructed in accordance with the requirements, rules, policies, and procedures adopted by the Ohio Facilities Construction Commission establishing Sustainability Requirements for Capital Improvements Projects, including but not limited to the applicable provisions of OAC 3318-3.

1.13.2 If the Project is designed and constructed under the Leadership in Energy and Environmental Design ("LEED") Rating System developed by the U.S. Green Building Council or another rigorous rating system used to facilitate achievement of sustainability goals for the Project, the Contractor shall provide submittals certifying achievement of sustainable design rating system criteria for verification by the Green Building Certification Institute or other third party in accordance with the Contract Documents.

ARTICLE 2 - STATE'S RIGHTS AND RESPONSIBILITIES

2.1 Contracting Authority

2.1.1 The Contracting Authority shall designate a Project Manager for the Project. The Project Manager is authorized to act on behalf of the Contracting Authority to perform specific responsibilities under the Contract.

2.1.2 The Contracting Authority shall furnish information and services required of it in a timely manner.

2.1.3 The Contracting Authority shall have access to the Work at all times, whenever the Project is in preparation or progress.

2.1.4 The Ohio Facilities Construction Commission requires use of its forms where indicated in the Contract Documents. The party responsible for initiating forms shall utilize the latest edition obtained from the Commission's website: https://ofcc.ohio.gov. The Commission may make modifications to its forms at any time.

2.1.4.1 The Contractor shall not modify any form provided by the Commission or Contracting Authority.

2.1.4.2 If the Project is administered using project management software, the Contractor shall utilize the web-based forms and reports within the applicable business process. The project management software is sponsored by the Commission, and the web-based forms and reports are acceptable to the Commission in lieu of its paper forms.

2.1.5 The Contracting Authority is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor's failure to carry out the Work in conformity with the Contract Documents.

2.2 Owner

2.2.1 The Owner shall designate a representative authorized to act on behalf of the Owner during the Project.

2.2.2 The Owner shall furnish information and services required of it in a timely manner.

2.2.3 The Owner shall have access to the Work at all times whenever the Project is in preparation or progress.

2.2.4 Upon issuance of the Notice to Proceed, the Owner shall provide the Site to the Contractor in a condition to permit the Contractor to perform the Work.

2.2.5 The Owner may request a change in the Work if the A/E recommends and the Contracting Authority approves the change.

2.2.6 The Owner shall communicate with the Contractor through the Contracting Authority.

2.2.7 The Owner is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor's failure to carry out the Work in conformity with the Contract Documents.

2.3 Approval of Owner, Contracting Authority, and State

2.3.1 The Owner, Contracting Authority, or State's review and approval of the Work and any information the Contractor submits to them is for the sole purpose of determining whether the Work and information are generally consistent with the Contract's intent, and will not relieve the Contractor of its sole responsibility for the performance, preparation, completeness, and accuracy of the Work and information.

2.4 Neutral Facilitation

2.4.1 The Contracting Authority or Owner may engage a Neutral Facilitator for the purposes of **(1)** building cooperative relationships among the Project participants to achieve discrete objectives; **(2)** encouraging educated, productive, and expedited attempts to avoid, minimize, and resolve disputes; and **(3)** maximizing the effectiveness of each participant's resources.

2.4.1.1 For example, a Neutral Facilitator may facilitate the organizational meeting, partnering session(s), and efforts to resolve disputes throughout the Project.

2.4.2 The Contracting Authority, Owner, and Contractor are entitled to interact with the Neutral Facilitator with the full expectation that **(1)** they may act, speak, and disclose information with complete candor and **(2)** all communication, whether oral or written, made in the course of facilitated sessions is confidential.

2.4.3 At any hearing or proceeding regarding any dispute arising out of or related to the Project **(1)** the Neutral Facilitator will not be competent to testify and shall not be called as a witness and **(2)** the Neutral Facilitator's testimony and work product will not be admissible.

2.4.4 The Neutral Facilitator will not **(1)** perform any services with respect to or bear any responsibility for any legal services, design-professional services, construction, or construction management associated with the Project or **(2)** have any liability whatsoever for any claims related to any legal services, design-professional services, construction, or construction management associated with the Project, including without limitation, claims for legal or design-professional errors or omissions, delays, cost overruns, faulty construction, or increased costs.

2.4.5 The Neutral Facilitator's participation in the Project will not relieve the Contracting Authority, Owner, and Contractor of any of their respective rights or obligations under the Contract.

2.5 Contractor Performance Evaluation

2.5.1 The Contracting Authority may evaluate the Contractor's performance during the progress of the Work, at completion of a Phase of the Project, completion of the Project, or any of the foregoing. The Contracting Authority shall retain the evaluation(s).

2.5.1.1 The Contractor may request a copy of the completed evaluation(s). If the Contractor wishes to comment or take exception to any rating or remark, the Contractor shall send a response in writing to the Contracting Authority within 30 days after receiving the evaluation(s).

2.5.1.2 The Contracting Authority may use the evaluation(s) in determining the responsibility of the Contractor for award of future contracts.

2.5.1.3 The Contracting Authority may request information from the Contractor for use in evaluating the A/E's performance. If information is requested, the Contractor shall comply in a timely and responsive manner.

2.5.1.4 If a breach of the Contract is committed by the Contractor or is attributable to a Subcontractor, that breach will be used in the responsibility analysis of the Contractor and Subcontractor (where applicable) for future contracts with the State or subcontracts on State projects for five years after the date of the breach.

ARTICLE 3 - A/E'S RESPONSIBILITIES

3.1 The A/E's Contract Administration Duties

3.1.1 The A/E shall administer the Contract as provided in the Contract Documents and Architect/Engineer Agreement, including, but not limited to, performance of the functions described as follows:

3.1.1.1 The A/E shall attend and conduct progress meetings. The A/E shall prepare an agenda and produce a written report of each progress meeting, and distribute the report to the Contracting Authority, Owner, and Contractor within three business days after the meeting. The A/E shall not delegate the duty to prepare the agenda and written reports of any progress meeting.

3.1.1.2 The A/E may authorize minor changes or alterations in the Work that are consistent with the intent of the Contract Documents and do not involve adjustment of the Contract Sum or Contract Times, or both. The A/E has no authority to authorize the Contractor to perform additional or extra Work for which the Contractor may seek adjustment of the Contract Sum or Contract Times, or both.

3.1.1.3 The A/E shall review and recommend, certify, or approve applicable forms required under the Contract Documents.

3.1.1.4 The A/E shall render decisions in connection with the Contractor's responsibilities under the Contract Documents, and submit recommendations to the Contracting Authority for enforcement of the Contract as necessary.

3.1.2 The A/E is the initial interpreter of all requirements of the Contract Documents. All decisions of the A/E are subject to final determination by the Contracting Authority.

3.2 Site Visits and Observation

3.2.1 The A/E shall notify, advise, and consult with the Contracting Authority and Owner and protect the State against Defective Work throughout completion of the Project, which includes the Correction Period.

3.2.1.1 The A/E shall designate a field representative, subject to the Contracting Authority's approval, to attend to the Project, to observe and check the progress and quality of the Work, and to take action as necessary or appropriate to achieve conformity with the Contract Documents.

3.2.1.2 The A/E shall have its consultants attend to the Project at intervals required by its agreement or the Contracting Authority.

3.2.2 The A/E is authorized to disapprove or reject Defective Work. The A/E shall immediately notify the Contracting Authority any time the A/E disapproves or rejects an item of Work.

3.2.3 The A/E is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor's failure to carry out the Work in conformity with the Contract Documents.

3.3 Testing and Inspection Services

3.3.1 Unless otherwise specified in the Contract Documents, the A/E, directly or through a consultant, shall manage, apply for, secure, and pay for the costs of structural testing and special inspections under Chapter 17 of the Ohio Building Code; testing including geotechnical analysis, environmental testing and analysis, concrete, masonry, structural steel, reinforcing steel, welding, bolts, steel connections, HVAC systems and controls, plumbing and piping, air and water balancing and testing, or other testing; or approval required by Applicable Law. The Contractor shall coordinate with the A/E and cooperate in the A/E's effort to complete the testing and inspection services required in this **Section 3.3**

3.4 Approval of A/E

3.4.1 The A/E's review and approval of the Work and any information the Contractor submits to the A/E is for the sole purpose of determining whether the Work and information are generally consistent with the Contract's intent, and will not relieve the Contractor of its sole responsibility for the performance, preparation, completeness, and accuracy of the Work and information.

3.5 Limitation of A/E's Authority

3.5.1 Under no circumstances is the A/E authorized to:

3.5.1.1 bind the Owner or Contracting Authority to any authorizations under, modifications of, or amendments to any contract other than as expressly described under **Section 3.1.1.2**;

3.5.1.2 accept any defective or non-conforming services, Work, or vendor-furnished items;

3.5.1.3 make any settlements on behalf of the Owner or Contracting Authority; or

3.5.1.4 assume any responsibilities of the Contractor or Subcontractors.

ARTICLE 4 - SUBCONTRACTORS

4.1 Evaluation and Approval

4.1.1 Within ten days after the Notice to Proceed, or other period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the A/E a **Subcontractor and Material Supplier Declaration** form through which the Contractor identifies its Subcontractors.

4.1.2 The Contractor's failure to timely submit the information regarding a proposed Subcontractor may result in withholding payment in accordance with **Section 9.8**.

4.1.3 After receiving the **Subcontractor and Material Supplier Declaration** form, the A/E shall verify that it is complete and deliver it to the Contracting Authority and Owner. If the A/E finds the form incomplete, the A/E shall return it to the Contractor and identify the incomplete information. If the A/E returns such incomplete forms to the Contractor, the Contractor shall resubmit the forms with revisions complying with the corrective action identified by the A/E.

4.1.4 If the Contracting Authority rejects any proposed Subcontractor, the Contractor shall propose a replacement Subcontractor with no adjustment of the Contract Sum. The proposed replacement Subcontractor will be evaluated as described above.

4.1.5 No less than ten days before Work is to be performed by the Subcontractor, or within a shorter period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the Contracting Authority and A/E a complete copy of the executed Subcontract between the Contractor and Subcontractor. After receiving the Subcontract,

the A/E shall verify that it is complete and deliver it to the Contracting Authority. If the A/E finds the Subcontract incomplete, the A/E shall return it to the Contractor and identify the incomplete information.

4.2 Form of Subcontract

4.2.1 All Subcontracts shall be on the **State of Ohio Subcontract Form** prescribed by OAC Section 153:1-03-02.

4.3 Replacement of Subcontractors

4.3.1 The Contractor shall not replace any Subcontractor after execution of the Subcontract without the prior written approval of the Contracting Authority.

4.4 Contractor's Responsibility

4.4.1 The Contractor is fully responsible for all acts and omissions of its Subcontractors and is responsible for scheduling and coordinating the Work of its Subcontractors.

4.4.1.1 The Contractor is fully responsible for any delay, interference, disruption, or hindrance attributable to its Subcontractors.

4.4.1.2 The Contractor shall require each of its Subcontractors to have a competent supervisor at the Site whenever the Subcontractor is performing Work.

4.4.1.3 The Contractor shall bind its Subcontractors to the terms of the Contract Documents, so far as applicable to the Work of the Subcontractor.

4.4.1.4 The Contractor shall not agree to any provision, which seeks to bind the State to terms inconsistent with or at variance from the Contract Documents.

4.4.2 The Contractor will not be relieved of its full responsibility for Subcontractors and their performance of the Work by **(1)** the participation of the Owner, Contracting Authority, and A/E in the processes described under this **Article 4** or other related provisions of the Contract Documents or **(2)** the Contracting Authority's rejection of a Subcontractor or failure to reject a Subcontractor under **Section 4.1**.

4.5 Contingent Assignment of Subcontracts

4.5.1 The Contractor hereby assigns its agreement with each Subcontractor to the Contracting Authority provided that the assignment is effective only after termination of the Contract in whole or in part by the Contracting Authority and only for those agreements that the Contracting Authority accepts by notifying the Contractor and applicable Subcontractors in writing. The Contracting Authority may re-assign accepted agreements.

4.5.1.1 If the Contracting Authority terminates the Contract in part, the Contracting Authority may **(1)** take assignment of any entire Subcontract affected by the termination or **(2)** take partial assignment of only the portion of any Subcontract associated with the terminated part of the Contract.

4.6 Prompt Payment

4.6.1 The Contractor shall make payments to Subcontractors in accordance with Applicable Law, including ORC Sections 153.12 and 4113.61.

4.6.2 The Contractor may reduce the amount paid to a Subcontractor pursuant to **Section 4.6.1** at a rate equal to the percentage retained from the Contractor and may withhold amounts necessary to **(1)** resolve disputed liens or claims involving the Work of the Subcontractor or **(2)** account for the failure of the Subcontractor to perform its obligations under its agreement with the Contractor.

ARTICLE 5 - PRECONSTRUCTION ACTIVITIES

5.1 Neutral Facilitation

5.1.1 The Contracting Authority or Owner may engage a Neutral Facilitator for the purposes of **(1)** building cooperative relationships among the Project participants to achieve discrete objectives; **(2)** encouraging educated, productive, and expedited attempts to avoid, minimize, and resolve disputes; and **(3)** maximizing the effectiveness of each participant's resources.

5.1.1.1 For example, a Neutral Facilitator may facilitate a preconstruction organizational meeting, a partnering session, or efforts to resolve disputes throughout the Project, all of which the Contractor shall participate in at the Contracting Authority's request. The Contractor's compensation for participating in those meetings, sessions,

efforts, and related activities is included in the Contract Sum, and the Contractor will not be entitled to an increase of the Contract Sum for participating as requested.

5.1.2 The Contracting Authority, Owner, and Contractor are entitled to interact with the Neutral Facilitator with the full expectation that **(1)** they may act, speak, and disclose information with complete candor and **(2)** all communication, whether oral or written, made in the course of facilitated sessions is confidential.

5.1.3 At any hearing or proceeding regarding any dispute arising out of or related to the Project **(1)** the Neutral Facilitator will not be competent to testify and shall not be called as a witness and **(2)** the Neutral Facilitator's testimony and work product will not be admissible.

5.1.4 The Neutral Facilitator will not **(1)** perform any services with respect to or bear any responsibility for any legal services, design-professional services, construction, or construction management associated with the Project or **(2)** have any liability whatsoever for any claims related to any legal services, design-professional services, construction, or construction management associated with the Project, including without limitation, claims for legal or design-professional errors or omissions, delays, cost overruns, faulty construction, or increased costs.

5.1.5 The Neutral Facilitator's participation in the Project will not relieve the Contracting Authority, Owner, and Contractor of any of their respective rights or obligations under the Contract.

5.2 Building and Trade Permits and Licenses

5.2.1 Plan Approval.

5.2.1.1 The A/E shall secure the required structural, plumbing, HVAC, and electrical plan approvals.

5.2.1.2 The Contractor shall schedule and attend all intermediate and final inspections required for any permit applicable to the Work. The Contractor shall schedule the State Fire Marshal or local fire authority for the life safety inspection for occupancy permits. The Contractor shall give the A/E, Contracting Authority, and Owner reasonable notice of the dates and times arranged for inspections.

.1 The Contractor shall pay for any reinspections required as a result of the Contractor's failure to receive approval of its Work, unless the reinspection is required because the design does not comply with Applicable Law.

5.2.2 Trade Permits and Licenses.

5.2.2.1 The Contractor shall obtain, maintain, and pay for any permit, inspection, or license applicable to the Contractor's particular trade.

5.2.3 Local Permits.

5.2.3.1 The Contractor shall secure and pay the fees for any permits, inspections, licenses, capacity charges, or tap fees required by local authorities having jurisdiction over the Project. The Contractor shall give the A/E, Contracting Authority, and Owner reasonable notice of the date arranged for inspections.

5.2.4 National Pollutant Discharge Elimination System ("NPDES") Storm Water General Permit.

5.2.4.1 The A/E shall secure the NPDES general permit by submitting a Notice of Intent ("NOI") application form to the Ohio Environmental Protection Agency at least 45 days prior to the start of construction. The Contractor shall be a "co-permitee" if required under Applicable Law.

5.2.4.2 The A/E shall prepare and certify a storm water pollution prevention plan to provide sedimentation and erosion controls at the Project.

5.2.4.3 The A/E shall prepare and process the required Notice of Termination ("NOT") prior to Contract Completion.

ARTICLE 6 - CONSTRUCTION AND CLOSEOUT

6.1 Commencement of Work on the Site

6.1.1 The Construction Stage will start and the Contract Times will begin to run on the Date of Commencement established in a Notice to Proceed, which the Contracting Authority will issue to the Contractor. The date on which the Contracting Authority issues the Notice to Proceed **(1)** is not relevant to the running of the Contract Times, and **(2)** may differ from Date of Commencement. Unless the Contracting Authority agrees otherwise in writing, the Contractor shall begin to perform the Work within seven days after the Date of Commencement and thereafter diligently prosecute the Work. The Construction Stage terminates upon Contract Completion.

6.2 Contractor's General Responsibilities

6.2.1 The Contractor shall **(1)** maintain a competent, full-time staff at the Site at all times that Work is in preparation or progress on the Project, **(2)** shall supervise the Work; **(3)** establish and implement on-Site organization and authority so that the Work is accomplished in conformance with the Project Schedule; and **(4)** complete portions of the Work in the sequence and time in the Construction Progress Schedule.

6.2.2 The Contractor shall perform the Work so as not to interfere with, disturb, hinder, or delay the services of Separate Consultants or the work of Separate Contractors. The Contractor shall cooperate and coordinate fully with all Separate Consultants and Separate Contractors and shall freely share all of the Contractor's Project-related information with them to facilitate the timely and proper performance of the Work and of the services and work of the Separate Consultants and Separate Contractors.

6.2.3 The Contractor shall afford every Separate Consultant and Separate Contractor proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of their services and work.

6.2.4 If the Contractor damages the property or work of any Separate Consultant or Separate Contractor, or by failure to perform the Work with due diligence, delays, interferes with, hinders, or disrupts the services of any Separate Consultant or the work of any Separate Contractor who suffers additional expense and damage as a result, the Contractor is responsible for that damage, injury, or expense.

6.2.5 The intent of **Sections 6.2.2** through **6.2.4** is to benefit the Separate Consultants and Separate Contractors, and to demonstrate that the Separate Consultants and Separate Contractors are intended third-party beneficiaries of the Contractor's obligations under the Contract.

6.2.6 If the proper execution or results of any part of the Work depends upon work performed or services provided by the Owner, a Separate Consultant, or a Separate Contractor, the Contractor shall inspect that other work and appropriate instruments of service, and promptly report to the Contracting Authority in writing any defects or deficiencies in that other work or services that render it unavailable or unsuitable for the proper execution and results of the Work. The Contractor's failure to report before starting the affected part of its Work will constitute an acceptance of the other work and services as fit and proper for integration with the Contractor's Work except for defects and deficiencies in the other work or services that were not reasonably discoverable at the time of the Contractor's inspection.

6.2.7 The Contractor shall not delay the Work on account of any claim, dispute, or action between the Contractor and a Separate Consultant or Separate Contractor.

6.2.8 The Contractor shall develop and keep current the Construction Progress Schedule in accordance with **Section 6.5**, and prepare and keep current a schedule of submittals that is coordinated with the Construction Progress Schedule, for the A/E and Contracting Authority's acceptance.

6.2.9 The Contractor shall monitor the progress of the Work for conformance with the Construction Progress Schedule and shall initiate revisions as required by **Section 6.5.6**.

6.2.10 The Contractor shall establish the Project's regular working hours, subject to approval by the A/E and the Owner.

6.2.11 The Contractor shall coordinate the Work with the activities and responsibilities of the A/E, Owner, and Contracting Authority to complete the Project in accordance with the Contract Documents.

6.2.12 In the event of default of the Contractor, the Contractor shall cooperate with the A/E, Owner, Contracting Authority, and Contractor's Surety to achieve the Substantial Completion date and Contract Completion.

6.2.13 The Contractor shall remove all snow and ice as may be required for reasonably safe access to the Project including, but not limited to, building entries, driveways, parking lots, and sidewalks.

6.2.14 The Contractor shall keep a daily log containing a record of weather, number of workers on Site, identification of equipment, Work accomplished, problems encountered, and other similar relevant data.

6.3 Construction Procedures

6.3.1 The Contractor is solely responsible for and has control over all construction means, methods, manners, techniques, sequences, and procedures, for safety precautions and programs in connection with the Work, and for coordinating all portions of the Work.

6.3.1.1 If the Contract Documents give instructions that affect construction means, methods, manners, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety of them and, except as stated below, shall

be fully and solely responsible for the jobsite safety of the means, methods, manners, techniques, sequences, or procedures.

6.3.1.2 If the Contractor determines that the means, methods, manners, techniques, sequences, or procedures specified in the Contract Documents may not be safe, the Contractor shall give timely written notice to the A/E, Owner, and Contracting Authority. The Contractor shall not proceed with that portion of the Work without further written instructions from the A/E. Any modification of the Contract shall be in accordance with **Article 7**.

6.3.2 The Contractor shall lay out and coordinate all lines, levels, elevations, and measurements for all of the Work, coordinate and verify existing conditions, and notify the A/E of discrepancies and conflicts before proceeding with installation or excavation.

6.3.3 The Contractor shall perform all cutting, fitting, or patching required for the Work and shall not endanger the Project by cutting, excavating, or otherwise altering the Project, or any part of it.

6.3.3.1 If the Contractor requires sleeves for the Work, the Contractor shall furnish and install the sleeves. The Contractor is responsible for the exact location and size of all holes and openings required to be formed or built for the Work.

6.3.3.2 The Contractor's patching shall match and blend with the existing or adjacent surface(s).

6.3.4 The Contractor shall comply with ORC Sections 3781.25 through 3781.32. In addition, before starting excavation or trenching, the Contractor shall determine the location of any underground utilities and notify any public authority or utility having jurisdiction over the Project and secure any required approval.

6.3.5 The Contractor shall install all Work in accordance with the Contract Documents and any installation recommendations of the manufacturer, including required temperature and humidity limits for installation of the various materials.

6.3.6 The Contractor shall comply with all requirements and conditions of the NPDES general permit, including, but not limited to, implementing and maintaining the sedimentation and erosion control measures specified in the storm water pollution prevention plan prepared by the A/E pursuant to **Section 5.2.4**, which are related to the Work, maintaining records of its construction activities, removing materials no longer required, and taking proper action if there is a reportable quantity spill.

6.3.7 The Contractor shall communicate with the Contracting Authority and Owner through the A/E.

6.4 Construction Supervision

6.4.1 Unless waived by the Contracting Authority in writing, the Contractor shall provide continuous supervision at the Site by a competent superintendent when any Work is being performed, and the Contractor's superintendent shall not be involved with any work other than the Project.

6.4.2 The Contractor's project manager and superintendent shall each have the responsibility and authority to act on behalf of the Contractor. All communications to the Contractor's project manager or superintendent shall be binding as if given directly to the Contractor.

6.4.3 Within ten days after the Date of Commencement, the Contractor shall submit to the Contracting Authority an outline of the qualifications and experience of the Contractor's proposed project manager and proposed superintendent, including references. Upon receiving a request from the Contracting Authority, the Contractor shall submit to the Contracting Authority an outline of the qualifications and experience of any Subcontractor's proposed project manager and proposed superintendent.

6.4.3.1 The Contracting Authority may reject the Contractor's or Subcontractor's proposed project manager or proposed superintendent. If the Contracting Authority does not notify the Contractor of the rejection within 30 days after receiving the required information, it shall indicate that the Contracting Authority has no objection, but does not affect the Contracting Authority's rights under **Section 6.12.2** or any other provision relative to that project manager or superintendent.

6.4.3.2 If the Contracting Authority rejects the Contractor's or Subcontractor's proposed project manager or proposed superintendent, the Contractor shall replace, or cause the Subcontractor to replace the project manager or superintendent (as appropriate) with someone acceptable to the Contracting Authority at no additional cost.

6.4.4 The Contractor and its Subcontractors shall not replace their respective project managers or superintendents without prior written approval of the Contracting Authority.

6.4.4.1 If the Contractor or a Subcontractor proposes to change its project manager or superintendent, the Contractor shall submit written justification to the Contracting Authority, along with the name and qualifications of the proposed replacement.

6.4.4.2 The procedure provided in **Section 6.4.3** shall be conducted to evaluate the Contractor's or Subcontractor's (as applicable) proposed replacement project manager or superintendent.

6.5 Construction Progress Schedule

6.5.1 General Requirements

6.5.1.1 The Contractor shall prepare and maintain the Construction Progress Schedule using the critical path method of scheduling and commercially available computer software acceptable to the Contracting Authority.

.1 In the Construction Progress Schedule, the Contractor shall **(1)** organize all Work activities into a logical work breakdown structure; **(2)** set forth a reasonable, efficient, economical, and practical plan to complete the Work within the Contract Times, and **(3)** convey the prosecution and progress of the Work in a manner that accounts for **(a)** normal adverse weather, as defined under **Section 7.10**, through reasonably anticipated productivity variations for weather-sensitive activities, **(b)** Legal Holidays, and **(c)** similar reasonably anticipated events.

6.5.1.2 The Contractor shall use the most-current, accepted Construction Progress Schedule **(1)** to plan, organize, execute, and manage the Work using early start dates and early finish dates; **(2)** to record and report actual performance and progress of the Work; **(3)** to show how it plans to coordinate and complete all remaining Work within applicable Milestones; and **(4)** as the basis for requests for extensions of the Contract Times.

6.5.1.3 The Project participants will use the Construction Progress Schedule as a tool for scheduling and reporting sequenced progress of the Work.

6.5.1.4 The Contracting Authority's, Owner's, or A/E's review, acceptance, or approval of any Construction Progress Schedule will not **(1)** relieve the Contractor of any of the Contractor's responsibilities under the Contract including the responsibility to perform the Work in accordance with the Construction Progress Schedule and within the Contract Times, or **(2)** imply, warrant, or acknowledge the reasonableness or accuracy of the logic, durations, cost, resource loading, or any other attributes of the Construction Progress Schedule.

6.5.1.5 The Contracting Authority may withhold payment from the Contractor on account of the Contractor's failure to prepare, maintain, or update the Construction Progress Schedule as required under the Contract.

6.5.2 Submission Requirements

6.5.2.1 The Contractor shall provide each submission of the Construction Progress Schedule **(1)** as a Gantt chart in PDF; **(2)** as a Gantt chart in hardcopy if the Contracting Authority requests; and **(3)** an Electronic File.

.1 The hardcopy format for the Construction Progress Schedule shall be 11x17 inch.

.2 The Electronic File of the Construction Progress Schedule shall be in .xer, .xml, or .mpp format.

6.5.2.2 At the Contracting Authority's request, the Contractor shall prepare and submit to the Contracting Authority reports produced through the scheduling software (collectively "Schedule Reports").

.1 Unless the Contracting Authority requests otherwise, the Contractor shall submit each Schedule Report in Electronic File format, PDF format, and 8.5x11 hardcopy format.

6.5.3 Schedule Information Requirements

6.5.3.1 General Requirements. The Contractor shall include at least the following information in the Construction Progress Schedule:

.1 a clear graphics legend;

.2 the Contracting Authority's Project number and Project name;

.3 a graphic presentation of the sequence of all of the Work;

.4 identification of each stage of the Work and any Milestone dates;

.5 identification of activities and durations for **(1)** entering into each Subcontract with an anticipated value in excess of 10% of the Construction Budget or as otherwise requested by the Contracting Authority; **(2)** preparation, review, and approval of Shop Drawings and other action submittals; **(3)** fabrication and review of mock-up Work; **(4)** product review and procurement, fabrication, shop inspection, and delivery, including, but not limited to, lead time and coordination drawing delivery; **(5)** Date of Commencement identified as "Start Milestone"; **(6)** date(s) of Substantial Completion identified as "Finish Milestone"; **(7)**

Punch List development; **(8)** Punch List correction; **(9)** Project close-out requirements; **(10)** occupancy requirements; and **(11)** Contract Completion;

.6 for each activity:

1. Activity ID, Activity Description, and Calendar ID;

2. identification of the single organization responsible for performing the activity;

3. early start, early finish, late start, late finish, duration, and total float;

4. in other than the baseline Construction Progress Schedule: original duration, remaining duration, and percentage of completion;

5. identification of predecessor and successor activities, constraints, and percentage of completion; and

6. a maximum duration that is appropriate for the activity but not in excess of 15 days except **(1)** non-construction activities such as procurement of materials, delivery of equipment, concrete curing, etc.; and **(2)** other activities for which the Contracting Authority may approve a longer duration;

.7 identification of disruptions and shutdowns due to other operations;

.8 identification of all planned work hours for each Work Day;

.9 identification of the longest path of the Work (in red) and all critical paths of the Work;

.10 identification of the crew size and total resource hours for each activity in the schedule;

.11 other items required by the Contracting Authority, Owner, or A/E; and

.12 the Contractor's signature approval and date lines, which the Contractor shall complete indicating approval of each submitted schedule.

6.5.3.2 Activity Identifications ("ID")

.1 Activity ID's shall follow the naming convention agreed upon between the Contracting Authority and the Contractor before the Contractor begins to prepare the baseline Construction Progress Schedule.

.2 Each Activity ID for a specific Activity Description shall remain unchanged and connected to its original Activity Description throughout the Project.

6.5.3.3 Activity Descriptions

.1 Each activity shall have a clear and concise Activity Description..

6.5.3.4 Activity Relationships

.1 All activities except Date of Commencement shall have at least one predecessor, and all activities except Contract Completion shall have at least one successor.

.2 To link activities, the Contractor may use **(1)** finish-to-start relationships with no leads or lags; **(2)** start-to-start relationships with lags no greater than the predecessor duration; or **(3)** finish-to-finish relationships when both activities are already aligned with a start-to-start relationship.

6.5.3.5 Project Level Activity Codes

.1 For each activity, the Contractor shall assign responsibility to an identified, single performing organization.

6.5.3.6 Project Level Calendars

.1 The Contractor shall create and maintain calendars at the project level.

6.5.3.7 No Global Data

.1 The Contractor may not use global data of any kind (e.g., codes, calendars, etc.).

6.5.3.8 Float and Critical Activities

.1 "Float" is the amount of time between the early start date and the late start date (or the early finish date and the late finish date) for each activity. Float is for the benefit of both the Contracting Authority and the Contractor; i.e., float is not for the Contractor's exclusive benefit. Either the Contracting Authority or the Contractor may use float on a first-come-first-served basis without cost impact. The Contractor may not suppress or consume float by artificially extending activity durations, creating dummy activities, or applying preferential sequencing.

1. The Contractor shall exhaust existing float before claiming additional time for a Modification, or show that it is not possible to use float to cover the time requirements of the Modification.

2. The Contractor may not suppress or sequester float through, for example, artificial/illogical sequencing, excessive durations, date constraints, float constraints, improper use of lag, or calendar manipulation.

.2 "Critical Activities" are activities **(1)** occurring on the longest path through the Construction Progress Schedule; or **(2)** with float of less than one day; or **(3)** both. The Contractor shall monitor and diligently pursue any activities with ten or fewer days of total float.

6.5.4 Baseline Construction Progress Schedule

6.5.4.1 Unless the Contracting Authority and Contractor agree otherwise, within 45 days after the execution of the Agreement, the Contractor shall submit to the Contracting Authority and A/E a fully developed, baseline Construction Progress Schedule in compliance with this **Section 6.5** that demonstrates the longest path and all critical paths for all of the Work.

.1 The Contracting Authority's approval of the baseline Construction Progress Schedule is a condition precedent to the Contractor's entitlement to payment under the Contract.

6.5.4.2 The Contractor shall develop the baseline Construction Progress Schedule based upon **(1)** the Contract Times defined in the Agreement, and **(2)** the schedule information included in the Bidding Documents.

6.5.4.3 In the event of a significant change or combination of changes, as determined by the Contracting Authority in its discretion, the Contracting Authority may identify a Contracting Authority-approved, updated or revised Construction Progress Schedule as the new baseline Construction Progress Schedule for future updates and reports.

6.5.5 Monthly Construction Progress Schedule Updates

6.5.5.1 The Contractor shall include a monthly Construction Progress Schedule update as a component of each of the Contractor's Progress Status Reports.

6.5.5.2 The Contractor shall generate monthly Construction Progress Schedule updates based upon and relative to the Contracting Authority-approved baseline Construction Progress Schedule and using retained logic (as opposed to logic override) to reflect and include:

.1 the actual progression and sequence of the Work;

.2 actual and projected start and completion dates;

.3 actual Modifications; and

.4 the longest path of the Work and all critical paths of the Work.

6.5.5.3 The Contractor shall use the first date of the next month at 12:01 a.m. as the data date for calculating the monthly Construction Progress Schedule update (e.g., progress through March will have a data date of April 1 @ 12:01 am).

6.5.5.4 The Contractor shall accurately input actual start and actual completion dates and correct all logic errors. If the Contractor changes/corrects any actual dates in any following month, the Contractor shall clearly identify the change/correction and provide a written explanation for it.

6.5.5.5 If the Contracting Authority requests, the Contractor shall include with each monthly Construction Progress Schedule update any of the associated Schedule Reports produced by the scheduling software.

6.5.5.6 The Contractor's submission of a monthly Construction Progress Schedule update shall serve as an affirmation that the Contractor intends to and is capable of performing the Work consistent with the associated monthly Construction Progress Schedule update.

6.5.5.7 The Contracting Authority and the A/E will review and may approve or reject and return the monthly Construction Progress Schedule update to the Contractor with recommendations for revisions.

6.5.6 Revised Construction Progress Schedules

6.5.6.1 Unless and until the Contracting Authority agrees in writing, the Contractor shall not change any of the accepted activities, activity durations, schedule logic, interdependencies, Milestones, planned sequence of operations, or resource loading set forth in the Construction Progress Schedule.

6.5.6.2 Once the Contracting Authority accepts a Modification involving Construction Progress Schedule changes (including no-cost time extensions such as on account of excessive weather days and other excusable delays), but not before then, the Contractor shall promptly incorporate the associated activity, duration, and logic changes, additions, combinations, eliminations, or other modifications into the then-current Construction Progress Schedule and submit for the Contracting Authority's approval **(1)** that revised Construction Progress Schedule; and **(2)** if the Contracting Authority requests, any of the associated Schedule Reports produced by the scheduling software.

6.5.6.3 If the Contractor incurs an inexcusable delay, the Contractor shall promptly incorporate any associated activity, duration, and logic changes, additions, combinations, eliminations, or other modifications into the then-current Construction Progress Schedule and submit for the Contracting Authority's approval **(1)** that revised

Construction Progress Schedule; and **(2)** if the Contracting Authority requests, any of the associated Schedule Reports produced by the scheduling software. The Contracting Authority's approval will not constitute an extension of the Contract Times due to the inexcusable delay.

6.5.6.4 The Contractor's submission of a revised Construction Progress Schedule shall serve as an affirmation that the Contractor intends to and is capable of performing the Work consistent with the associated revised Construction Progress Schedule update.

6.5.6.5 If the Contracting Authority and the Contractor cannot reach agreement on Construction Progress Schedule modifications resulting from a Modification or inexcusable delay, and the Contracting Authority requests, the Contractor shall prepare and submit a time-impact analysis when and as described under **Section 7.9.3**.

6.5.7 Short-Interval Schedules and Weekly Schedule Reports

6.5.7.1 A "Short-Interval Schedule" is a three- to four-week (past week, current week, and the next one to two weeks) schedule window that **(1)** breaks down existing schedule activities into smaller and more-manageable components with relatively short durations; and **(2)** is consistent with the then-current Construction Progress Schedule.

6.5.7.2 On a weekly basis, and no less than 24 hours before the next regularly scheduled Progress Meeting, the Contractor shall prepare and submit a Short-Interval Schedule to the A/E. The Contractor shall present and be prepared to discuss the Short-Interval Schedule during that Progress Meeting, and the A/E shall attach the Short-Interval Schedule to the minutes of that Progress Meeting.

6.5.8 Recovery Plan and Revised Construction Progress Schedule

6.5.8.1 If it is apparent to the Contracting Authority or A/E that the Contractor may be unable to meet critical path activities, Milestone completion dates, or the Substantial Completion date(s); the A/E shall direct the Contractor to submit within three days a recovery plan to avoid or minimize delay to the Project.

6.5.8.2 A recovery plan shall include, but is not limited to, adjustments to the following:

- **.1** workforce;
- **.2** hours per shift;
- **.3** shifts per workday;
- **.4** workdays per week;
- **.5** material and equipment procurement; and
- **.6** activity logic.

6.5.8.3 The Contractor's submission of a recovery plan shall serve as an affirmation that the Contractor **(1)** prepared the recovery plan in consultation with its Subcontractors, and **(2)** intends to and is capable of performing the Work consistent with that recovery plan.

6.5.8.4 If the Owner and Contracting Authority approve the recovery plan, within seven days after the plan approval, the Contractor shall incorporate that plan into a revised Construction Progress Schedule which the Contractor shall prepare and submit for review and approval in accordance with **Section 6.5.6**. If the Owner and Contracting Authority do not approve the recovery plan, the Contractor shall submit an alternate recovery plan within three days.

6.5.9 Small-Project Exceptions

6.5.9.1 This **Section 6.5** applies to a Small Project, which is a Project for which the initial Contract Sum is less than $500,000, except as explicitly provided in this **Section 6.5.9.**

6.5.9.2 In lieu of **Section 6.5.2**, the Contractor shall provide each submission of the Construction Progress Schedule **(1)** as a Gantt chart in PDF; **(2)** as a Gantt chart in hardcopy if the Contracting Authority requests; and **(3)** an Electronic File in its native format.

6.5.9.3 In lieu of **Section 6.5.3**, the Contractor shall include at least the following information in the Construction Progress Schedule:

- **.1** a clear graphics legend;
- **.2** the Contracting Authority's Project number and Project name;
- **.3** identification of each stage of the Work and any Milestone dates;
- **.4** identification of activities and durations for **(1)** date(s) of Substantial Completion; **(2)** Project close-out requirements; and **(3)** and Contract Completion;
- **.5** for each activity, a maximum duration that is appropriate for the activity but not in excess of 15 days;
- **.6** other items required by the Contracting Authority, Owner, or A/E; and

.7 the Contractor's signature approval and date lines, which the Contractor shall complete indicating approval of each submitted schedule.

6.5.9.4 In lieu of **Section 6.5.4.1**, unless the Contracting Authority and Contractor agree otherwise, within 15 days after the execution of the Agreement, the Contractor shall submit to the Contracting Authority and A/E a fully developed, baseline Construction Progress Schedule in compliance with this **Section 6.4.**

6.5.9.5 In lieu of **Section 6.5.5.2,** the Contractor shall generate monthly Construction Progress Schedule updates based upon and relative to the Contracting Authority-approved baseline Construction Progress Schedule to reflect and include **(1)** the actual progression and sequence of the Work; **(2)** actual and projected start and completion dates; and **(3)** actual Modifications.

6.5.9.6 The Contractor may, but is not obligated to comply with **Sections 6.5.3.4**, **6.5.3.5**, **6.5.3.6**, **6.5.3.7**, **6.5.5.3**, **6.5.5.4**, and **6.5.5.5**.

6.6 Progress Meetings

6.6.1 The A/E shall schedule a weekly progress meeting for the Contractor and other Persons involved in the Project. The purpose of the progress meeting is to review progress on the Project during the previous week, discuss anticipated progress during the following weeks, review critical operations, and discuss critical problems.

6.6.2 The Contractor shall be represented at every progress meeting by a Person authorized with signature authority to make decisions regarding possible modification of the Contract Documents or Construction Progress Schedule.

6.6.2.1 The A/E shall notify the Contractor and other Persons involved in the Project of the time and place of the progress meeting that shall thereafter be the same day and hour of the week for the duration of the Project, unless the A/E notifies the Contractor and other Persons involved in the Project of a different day and hour at least two days in advance.

6.6.2.2 The Contractor shall have any of its Subcontractors attend the progress meeting as determined advisable by the Contractor, or as requested by the A/E.

6.6.3 The A/E shall prepare a written report of each progress meeting and distribute the report to the Contracting Authority, Owner, and Contractor. The A/E shall not delegate the duty to prepare a written report of any progress meeting.

6.6.3.1 If any Person in attendance objects to anything in a report of a progress meeting, the Person shall notify the A/E, Contracting Authority, and any other affected Person in writing explaining the objection within five days.

6.6.3.2 The report of each progress meeting shall reflect any objection made to the report of the previous progress meeting and any response.

6.7 Project Coordination

6.7.1 The Contractor shall prepare drawings ("Coordination Drawings") after the Contractor and appropriate Subcontractors ("Coordination Participants") **(1)** determine the sequence of the Project, **(2)** identify the areas requiring special attention ("Coordination Areas"), and **(3)** determine the need for a coordination drawing for any Coordination Area. The Contractor shall prepare the Coordination Drawings with Computer-Aided Design ("CAD") or BIM software acceptable to the Contracting Authority. The Coordination Drawings shall show the sheet metal work with plan and elevation dimensions, which specifically locate all HVAC ductwork, HVAC equipment, and HVAC piping for each Coordination Area based upon the information, discussion, and resulting consensus of the Coordination Participants.

6.7.1.1 After the Contractor completes the Coordination Drawings, the Contractor shall forward a copy of the Coordination Drawings to the A/E, Contracting Authority, and Owner.

6.7.1.2 The A/E shall review the Coordination Drawings to determine whether the Coordination Participants achieved the goals listed in **Section 6.7.1**. The A/E shall report any concerns, in writing, to the Coordination Participants within 14 days after receiving the drawings.

6.8 Review of Contract Documents and Field Conditions

6.8.1 Before starting each portion of the Work, the Contractor shall carefully study and compare the various Contract Documents relative to that portion of the Work, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the Site affecting it.

6.8.2 If the Contractor finds any perceived ambiguity, conflict, error, omission, or discrepancy on or between any of the Contract Documents, or between any of the Contract Documents and any Applicable Law, the Contractor, before proceeding with the Work, shall promptly submit a RFI to the A/E for an interpretation or clarification.

6.8.2.1 Before submitting any RFI to the A/E, the Contractor shall carefully review the Contract Documents to ensure that the Contract Documents do not answer the RFI.

6.8.2.2 The A/E shall promptly respond to each RFI.

6.8.2.3 Any interpretation or clarification of the Contract Documents made by any Person other than the A/E, or in any manner other than writing, shall not be binding and the Contractor shall not rely upon it.

6.8.3 If the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of clarifications or instructions issued by the A/E in response to a RFI, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6**, and **(2)** within the time period under **Section 7.6**, which begins to run on the day that the Contractor receives the A/E's RFI response.

6.9 Differing Site Conditions

6.9.1 If the Contractor reasonably believes that it has encountered a Differing Site Condition, the Contractor shall immediately stop Work on that suspected Differing Site Condition and verbally report the condition to the Contracting Authority and A/E, and within one business day deliver written notice of the condition to the Contracting Authority and A/E.

6.9.1.1 The Contractor's failure to give notice of the Differing Site Condition as required under this **Section 6.9** will constitute an irrevocable waiver of any associated Claim.

6.9.1.2 The written notice of a Differing Site Condition under this **Section 6.9** shall be required before submission of a Change Request under **Section 7.6** or notice of Claim under **Article 8**.

6.9.2 Promptly after receiving notice from the Contractor under **Section 6.9.1**, the A/E shall investigate to determine whether the Contractor has encountered a Differing Site Condition. The A/E shall give written notice of its determination to the Contracting Authority and Contractor within ten days after completing the investigation.

6.9.2.1 If the A/E determines that the Contractor has encountered a Differing Site Condition and the Contracting Authority and Contractor agree with the A/E's determination, the A/E shall process an associated Change Order or Change Directive as appropriate.

6.9.2.2 If the A/E determines that the Contractor has encountered a Differing Site Condition, but the Contracting Authority disagrees with the A/E's determination, the A/E shall process an associated Change Directive through which the Contracting Authority may convey its disagreement with the A/E's determination.

6.9.2.3 If the A/E determines that the Contractor has not encountered a Differing Site Condition and the Contractor does not agree with that determination, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6**; and **(2)** within the time period required under **Section 7.6** which begins to run on the day that the A/E issues its determination.

6.10 Protection of the Project

6.10.1 The Contractor shall protect the Work from weather and maintain the Work and all materials, apparatus, and fixtures free from injury or damage until Substantial Completion of the Work.

6.10.1.1 The Contractor shall at all times cover or protect the Work.

6.10.1.2 The Contractor, at its expense, shall remove, and replace with new, any Work damaged as a result of the Contractor's failure to provide coverage or protection.

6.10.1.3 The Contractor, at its expense, shall repair or replace any adjacent property, including, but not limited to, roads, walks, shrubbery, plants, trees, or turf, damaged during performance of the Contract.

6.10.1.4 After the date of Substantial Completion of the Work, the Owner is responsible for protecting and maintaining all materials, apparatus, and fixtures for the occupied portion of the Project free from injury or damage.

6.10.2 The Contractor shall protect the Project and existing or adjacent property from damage at all times and shall erect and maintain necessary barriers, furnish and keep lighted necessary danger signals at night, and take reasonable precautions to prevent injury or damage to individuals or property.

6.10.3 The Contractor shall not load, or permit any part of the Project to be loaded, in any manner that endangers the Project, or any portion thereof. The Contractor shall not subject any part of the Project or existing or adjacent property to stress or pressure that endangers the Project or property.

6.10.4 The Contractor shall provide all temporary bracing, shoring, and other structural support required for safety and proper execution of the Work.

6.10.5 Vibration, Noise, and Dust Control.

6.10.5.1 The Contractor shall provide controls/barriers for vibrations, noise, and dust control in occupied buildings as required by the construction operations.

6.10.5.2 The Contractor will not be permitted to exhaust or release unfiltered air, dust, construction debris, or other undesirable products into the exterior atmosphere or into occupied areas of the building outside the Site. The Project Manager may limit or stop the Work if the Contractor does not maintain proper air-quality standards.

6.10.5.3 In certain occupied buildings, tasks might be of such a nature that noise and vibration cannot be tolerated. In such spaces, Work shall be scheduled for other than normal working hours. The Contractor is cautioned that weekend or overtime work, if required, shall be performed at no additional cost. The Contractor shall obtain the Contracting Authority's written permission before working other than standard hours. Weekend and overtime Work shall be reflected in the Construction Progress Schedule.

6.10.5.4 The Contractor is responsible for vibration control and control of transmission of noise arising from the Work. Principal considerations that shall be given to noise and vibration control are:

- **.1** Noise control in compliance with Occupational Safety and Health Administration ("OSHA") requirements for the health and safety of building occupants; control shall be for all areas of the facility, including equipment rooms, boiler rooms, and fan rooms.
- **.2** Vibration control to limit sound produced by construction equipment, and for protection of the equipment existing in a building and the building structure.
- **.3** Vibration control to provide for maximum usefulness of the facility by keeping levels of vibration within ranges conducive to study and work or other uses for which the facility is designed.

6.11 Materials and Equipment

6.11.1 The Contractor shall bring to or store at the Site only the materials and equipment required in the Work. If possible, materials and equipment should be installed in their final positions when brought to the Site.

6.11.1.1 The Contractor shall properly store and protect all materials and equipment it provides to the Project.

6.11.1.2 The Contractor shall timely remove from the Site any materials or equipment no longer required for the Work.

6.11.2 The Contractor shall not allow materials or equipment to damage the Project or adjacent property, or to endanger any individual at or near the Site.

6.11.3 If the Contractor provides an Acceptable Component, the Contractor shall be solely responsible for the costs of coordination and modification required.

6.11.4 If the Contractor provides approved Substitutions that require changes to the Contract Documents, the Contractor shall be solely responsible for the additional costs incurred as a result, including, but not limited to, changes to the design by the A/E.

6.11.5 The A/E shall consider Requests for Substitutions after the Bid opening only when the Contractor can conclusively demonstrate to the A/E the following conditions:

6.11.5.1 the specified Basis of Design Components, Acceptable Components, or previously-approved Substitutions, through no fault of the Contractor or a Subcontractor, are not available; or

6.11.5.2 the specified Basis of Design Components, Acceptable Components, or previously-approved Substitutions will not perform as designed or intended.

6.11.6 The Contractor's incorporation of unapproved Substitutions in the Work is Defective Work.

6.12 Labor

6.12.1 The Contractor shall maintain a sufficient workforce and enforce good discipline and order among its employees and the employees of its Subcontractors. The Contractor shall not permit employment of individuals not skilled in tasks assigned to them.

6.12.2 The Contractor shall dismiss from the Project any individual employed by the Contractor, or a Subcontractor, who the Contracting Authority finds, in its sole discretion, to be incompetent, guilty of misconduct, or detrimental to the Project.

6.12.3 The Contractor shall employ all legal efforts to minimize the likelihood or effect of any strike, Work stoppage, or other labor disturbance. Informational pickets shall not justify any Work stoppage.

6.13 Safety Precautions

6.13.1 The Contractor shall take reasonable precautions to ensure the safety of individuals on the Project.

6.13.1.1 The Contractor is responsible for designing and implementing its own safety program, including compliance with OSHA regulations. The Contractor's safety plans, such as fall protection, hazards, communications, competent person, etc., shall meet or exceed the Owner's safety plan (if any).

6.13.2 The Contractor shall pay any fine or cost incurred because of the Contractor's violation, or alleged violation, of Applicable Law.

6.13.3 Before starting any Work, the Contractor shall submit to the Contracting Authority a copy of the Contractor's site-specific safety plan and safety manuals.

6.13.4 The Contractor shall not introduce Hazardous Materials to the Project (other than as specified in the Contract Documents or customary construction materials or equipment) or burn any fires on the Site.

6.13.4.1 If the Contractor brings Hazardous Materials to the Project, the Contractor shall take reasonable precautions to prevent the Hazardous Materials from causing bodily injury or death, property damage, or environmental damage.

6.13.4.2 The Contractor shall notify the Project Manager 24 hours before the start of non-routine or non-recurring hot-work. Use of sources of fire, flame or sparks and flammable materials shall be kept to an absolute minimum. At the beginning of the Project, the Contractor shall inform the Project Manager of its intent to use blowtorches, welding apparatus or similar exposed flame and sparking devices. The Contractor shall give similar notice in regard to the use of flammable liquids, adhesives, and cleaners.

6.13.4.3 The Contractor shall furnish an appropriate number of fire extinguishers (minimum of one), which shall be within the immediate areas where work is being done at all times. The extinguisher(s) shall be adequate and suitable for the class of fire likely to be caused by the Contractor's operations.

6.13.5 Work Stoppage Due to Hazardous Materials.

6.13.5.1 If the Contractor encounters material the Contractor reasonably believes to be or contain, a Hazardous Material that has not been rendered harmless, the Contractor shall immediately stop Work in the affected area and verbally report the condition to the Contracting Authority and A/E, and within one business day deliver written notice of the condition to the Contracting Authority and A/E.

6.13.5.2 The Contracting Authority will promptly determine the necessity of the Owner retaining a qualified environmental consultant to evaluate the suspected Hazardous Material and to issue a related written report. Where appropriate, the Owner will engage a licensed abatement contractor to remove the material or render it harmless as directed.

6.13.5.3 The Contractor shall resume Work in the affected area upon written notice from the A/E that **(1)** the suspect material was evaluated and found not to be or contain a Hazardous Material, or **(2)** the suspect material has been removed or rendered harmless.

6.13.5.4 If the Contractor knowingly or negligently proceeds with the Work in an area where a Hazardous Material exists and has not been rendered harmless, the Contractor shall be solely responsible for all related claims, damages, losses, and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from performing the Work in the affected area.

6.13.5.5 The term "rendered harmless" means that the level of exposure is less than any applicable exposure standards set forth in Applicable Law.

6.13.6 Safety Data Sheets.

6.13.6.1 The Contractor shall identify any material it uses at the Site with a Safety Data Sheet ("SDS") meeting the requirements of OSHA's Hazard Communication Standard.

6.13.6.2 The Contractor shall maintain a notebook containing all of its applicable SDSs. That notebook shall be kept at the Site for the duration of the Project.

6.14 Construction Facilities, Utilities, and Equipment

6.14.1 Facilities.

6.14.1.1 The Contractor shall provide and maintain clean and suitable temporary facilities, equipment, services, and enclosed storage for its use at the Site.

6.14.1.2 The Contractor shall provide and maintain in a clean condition:

.1 suitable facilities, equipment, and services for use by the A/E and Contracting Authority;

.2 adequate space, equipment, furnishings, and services to conduct progress meetings including Wi-Fi internet access and the ability to conduct internet-based video conferences, and a large-format electronic display of suitable scale for the meeting room;

.3 adequate space to store approved documents and permits; and

.4 adequate sanitary facilities for use by all Persons at the Site.

6.14.2 Environmental Controls.

6.14.2.1 The Contractor shall protect its Work and materials from weather and damage from heat, cold, and humidity.

6.14.2.2 Until the permanent HVAC system is complete and available for use:

.1 the Contractor shall make arrangements and pay for installation and maintenance of temporary heating and ventilating systems; and

.2 the Contractor shall pay the costs incurred in operating the temporary heating and ventilating systems.

6.14.2.3 When the permanent HVAC system is complete and available for use:

.1 The Contractor shall start up and maintain operation of the permanent HVAC system, including filters, and promptly remove temporary heating and ventilating systems.

.2 If the Project consists entirely of new construction, the Contractor shall pay the costs of energy consumed in operating the permanent HVAC system until Substantial Completion.

.3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the costs of energy consumed in operating the permanent HVAC system.

6.14.2.4 From the date of Substantial Completion, the Owner shall pay the cost of operating the permanent HVAC system for the occupied portion of the Project.

6.14.2.5 If the permanent HVAC system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.14.3 Water and Drainage.

6.14.3.1 The Contractor shall provide water necessary for the Work until the permanent plumbing system is available for use.

6.14.3.2 The Contractor shall provide temporary drainage and dewatering necessary for the Work and shall employ pumps, trenches, drains, sumps, and other necessary elements required to provide satisfactory working conditions for the protection, execution, and completion of the Project.

6.14.3.3 The Contractor shall make arrangements and pay for installation and maintenance of temporary plumbing systems until the permanent plumbing system is available for use.

6.14.3.4 When the permanent plumbing system is complete and available for use:

.1 The Contractor shall start up and maintain operation of the permanent plumbing systems, and make arrangements and pay for removal of temporary plumbing systems.

.2 If the Project consists entirely of new construction, the Contractor shall pay the costs of water consumed and sewerage charges until Substantial Completion.

.3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the costs of water consumed and sewerage charges.

6.14.3.5 From the date of Substantial Completion, the Owner shall pay the costs of water consumed and sewerage charges for the occupied portion of the Project.

6.14.3.6 If the permanent plumbing system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.14.4 Electric Service.

6.14.4.1 The Contractor shall provide temporary light and power; and pay the charges for temporary electric service installation and removal if required.

6.14.4.2 If the Project consists entirely of new construction, the Contractor shall pay the cost of energy consumed until Substantial Completion.

6.14.4.3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the cost of energy consumed.

6.14.4.4 From the date of Substantial Completion, the Owner shall pay the cost of energy consumed for the occupied portions of the Project.

6.14.4.5 If the permanent electrical system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.14.5 Hoisting Facilities.

6.14.5.1 The Contractor shall erect and maintain any hoisting equipment required for its Work.

6.14.5.2 If the electric service requirements of hoisting facilities differ from that available at the Site, the Contractor shall provide and pay for all necessary connections.

6.14.5.3 If a permanent elevator is identified in the Contract Documents to be used for hoisting materials or personnel during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.15 Progress Cleaning

6.15.1 The Contractor shall remove all waste materials, rubbish, and mud attributable to the Work to an appropriate disposal location at or near the Site.

6.15.2 The Contractor shall perform weekly broom cleaning of hard flooring surfaces in the area of the Work.

6.15.3 The Contractor shall remove, once each working day or as appropriate for the Project, all waste materials and rubbish from the disposal location at or near the Site.

6.15.4 The Contractor shall remove, as appropriate for the Project or as the A/E or Owner directs, any waste materials or rubbish from areas adjacent to the Project.

6.15.4.1 The Contractor shall dispose of waste materials, rubbish, and construction debris in a lawful manner in approved recycling facilities or landfills.

6.15.5 If the Contractor fails to clean up during the progress of the Work, the Contracting Authority may clean up on behalf of the Contractor and at the Contractor's expense. If the Contractor fails to maintain the areas adjacent to the Project clean and free of waste materials and rubbish, the Contracting Authority may also direct the local jurisdiction responsible for the area to have the area cleaned to its satisfaction at the Contractor's expense.

6.15.5.1 The Contracting Authority may deduct the cleaning costs from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.15.6 The Contractor shall remove excavated material and spoil to a suitable off-site location approved by the Contracting Authority.

6.15.6.1 If the Owner designates a location on its property for disposal or storage of clean topsoil and/or subsoil in the Contract Documents, the Contractor shall remove such materials to the designated location.

6.16 Use of Premises

6.16.1 The Contractor shall use corridors, stairs, and elevators as designated by the Contracting Authority. The Contractor shall exercise extreme care to not exceed the carrying capacity of elevators or damage the cab interior in any way.

6.16.2 Loitering or wandering through the interior of buildings or exterior grounds outside the limits of the Work will not be permitted.

6.16.3 The Contractor shall confine its apparatus, materials, and the operations of its workers to the limits indicated by Applicable Law and the directions of the A/E or Project Manager.

6.16.4 No signs or advertising of any kind will be permitted on or about the Site, except those appearing on trucks and trailers.

6.16.5 Site Logistics Plan.

6.16.5.1 No later than seven days after the Date of Commencement, the Contractor shall prepare a Site Logistics Plan and submit it to the Contracting Authority and Owner for their review and approval. Through the Site Logistics Plan, the Contractor shall indicate how the Contractor intends to use the Site, and illustrate things such as areas to be used for lay down of material and equipment; office and storage trailer locations; vehicular access gates with ingress and egress routes; locations of wheel wash and concrete truck wash out activities; and offloading and hoisting locations.

6.16.6 Smoking and Tobacco Products.

6.16.6.1 All State buildings are smoke free. Smoking will not be permitted in any indoor area. The ban on tobacco products will be observed in all indoor and outdoor areas and parking areas on all State-owned and -leased property. The Contractor shall enforce these restrictions on any individual employed by the Contractor or a Subcontractor.

6.17 Interruption of Existing Services

6.17.1 Whenever it becomes necessary to interrupt existing services in use by the Owner or its tenants, including but not limited to sewer, water, gas, and steam lines, electric, telephone, and cable service, the Contractor shall continue the associated Work on a non-stop 24-hour per day basis until that Work is completed and the service restored, or at an alternate time required by the Contracting Authority.

6.17.2 Before beginning that Work, the Contractor shall apply in writing to, and receive approval in writing from, the Owner, through the A/E, to establish a time when interruption of the service will cause a minimum of interference with the activities of the Owner and its tenants.

6.18 Explosives and Blasting

6.18.1 The Contractor shall not conduct blasting on, or bring explosives to, the Site without the prior written approval of the Contracting Authority, Owner, and other authorities with jurisdiction.

6.18.2 The Contractor shall perform all blasting, storing, and handling of explosives as required under Applicable Law.

6.18.2.1 The Contractor shall carry appropriate liability insurance coverage, as required by the Contract Documents, for its blasting and explosives storage and handling operations. Immediately upon request, the Contractor shall deliver evidence of that insurance to the Contracting Authority.

6.19 Building Commissioning

6.19.1 If the Project scope includes building commissioning, the Contractor shall participate in the Commissioning Process, as prescribed in the Contract Documents.

6.19.2 The Contractor shall permit the A/E, or a third-party Commissioning Agent ("CxA") if applicable, access to commission performance based equipment, fixtures, and systems (e.g., HVAC, fire protection, smoke evacuation, fume hoods, emergency power, etc.), prior to Substantial Completion.

6.19.3 The A/E, or CxA if applicable, shall promptly notify the Contractor in writing of any deficiency identified during the Commissioning Process.

6.19.4 To facilitate the Commissioning Process, the Contractor shall submit one hard copy and one electronic copy of Operation and Maintenance Manuals for dynamic and engineered systems to the A/E, and CxA if applicable, for approval. That submission shall occur within 30 days following approval of all related Contractor submittals required by the Contract Documents.

6.20 Action Submittals

6.20.1 Submittal Description. Shop Drawings, Product Data, Samples, and other submittals for the A/E's review and action shall be provided by the Contractor for any item required by the Contract Documents but not fully described in the Contract Documents, unless waived by the A/E, and include, but are not limited to:

6.20.1.1 construction of the various parts, method of joinery, type of materials, grade, quality and thickness of materials, alloy of materials, profiles of all sections, reinforcement, method of hanging doors or installing windows, anchorage, and type and grade of finish;

6.20.1.2 capacities, types of materials and performance charts that are pertinent to the materials, and performance charts that are pertinent to the equipment item; and

6.20.1.3 wiring diagrams, control diagrams, schematic diagrams, working and erection dimensions, arrangement, and specifications.

6.20.2 Form of Submittals. The Contractor shall provide a transmittal letter, review and stamp its approval, and transmit the submittals to the A/E in accordance with the submittal schedule established by the A/E and Contractor.

6.20.2.1 The Contractor shall submit a minimum of one reproducible and three copies of Shop Drawings, and a minimum of four copies of any other submittal, except when using the project management software under **Section 2.1.4.2**.

6.20.2.2 The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to communicate to the A/E the materials and equipment that the Contractor proposes to provide.

6.20.2.3 Each Sample shall be identified clearly as to materials, supplier, pertinent data as catalog numbers, the intended use, and other uses as the A/E may require enabling the A/E to review the submittal.

6.20.3 Delegated Design.

6.20.3.1 If the Contract Documents require the Contractor to provide professional design services or certifications by a design professional related to systems, materials, or equipment, the Contractor shall confirm with the A/E the appropriate performance and design criteria that such services shall satisfy. The Contractor shall submit Shop Drawings and other submittals related to the Work designed or certified by the design professional retained by the Contractor to the A/E for review.

6.20.4 Variation from Contract Documents. If the submittals show variations from the requirements of the Contract Documents, the Contractor shall specifically and clearly identify the variations in its letter of transmittal.

6.20.4.1 Variations that may affect the construction quality, cost or timeline shall be submitted by the A/E to the Contracting Authority for review, and if approved, shall be incorporated into the Work by Change Order or an order for a minor change in the Work (as appropriate).

6.20.4.2 The Contractor shall not be relieved of responsibility for deviations from the Contract Documents by the A/E's approval of submittals.

6.20.4.3 Submittals are not Contract Documents. In the event of conflicts between submittals and the Contract Documents, the Contract Documents take precedence and govern the Work.

6.20.5 Contractor's Submittal Review. The Contractor shall review and stamp "approved" all submittals before forwarding them to the A/E. If it is apparent to the A/E that the Contractor has not reviewed the submittals, or has conducted an incomplete review, the A/E may reject the submittals.

6.20.5.1 The Contractor shall field verify conditions as necessary and make corrections of dimensions, locations of various items, encroachments of work of Separate Contractors, or variations from the requirements of the Contract Documents.

6.20.5.2 If required by the Contract Documents or Applicable Law, the Contractor shall have Shop Drawings or other submittals prepared by Persons possessing expertise and experience in an appropriate trade or profession or by a registered architect, professional engineer, or other professional as required under Applicable Law.

6.20.5.3 By approving and submitting submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related to the associated Work, or shall do so, and has checked and coordinated the information contained within the submittals with the requirements of the Work and of the Contract Documents.

6.20.6 A/E's Submittal Review. The A/E shall review submittals for conformity with design intent within 14 days after receiving them or in accordance with the approved submittal schedule, or other period as mutually agreed by the A/E and Contractor. The A/E's review of submittals is to determine if the items covered by the submittals will, after installation and incorporation into the Work, conform to the Contract Documents and be compatible with the design concept of the Project as a functioning whole.

6.20.6.1 The Contractor shall make corrections required by the A/E and resubmit the required number of corrected copies of submittals until approved, which resubmission shall be acted upon by the A/E within 14 days after receiving them, or other period mutually agreed by the A/E and Contractor.

6.20.6.2 When resubmitting corrected submittals, the Contractor shall direct the A/E's attention to revisions made by noting revisions on the resubmittal.

6.20.6.3 The Contractor shall pay all reasonable costs of the A/E, Owner, and Contracting Authority for attendant delay, interference, hindrance, or disruption of the Project due to excessive resubmittals without fault of the A/E, Owner, or Contracting Authority. Resubmittals in excess of two without fault of the A/E, Owner, or Contracting Authority may be determined excessive by the Contracting Authority.

6.20.6.4 The A/E may hold Samples and other submittals used to coordinate finishes, colors, patterns, textures, or other characteristics until submittals for adjacent materials are available. Within seven days after receiving the submittal, the A/E shall issue a written notice to the Contractor stating that the submittal is being held.

6.20.6.5 If coordinating submittals are not received within the period required for action on previously received submittals that are held in accordance with **Section 6.20.6.4**, review of the previously received submittals may be delayed.

6.20.6.6 The A/E's review shall not extend to means, methods, manners, techniques, sequences, or procedures of construction, or to safety precautions or incident programs.

6.20.6.7 The review and approval of a separate item shall not indicate approval of the assembly in which the item functions.

6.20.7 Risk of Nonpayment. The Contractor shall not commence any portion of the Work requiring Shop Drawings, Product Data, Samples, or other submittals until the submittal has been approved by the A/E. If the Contractor starts Work before the A/E's final approval of the submittal, the Contractor does so at its own risk that payment may not be approved by the Contracting Authority or made by the Owner for the related Work.

6.21 Warranty

6.21.1 The Contractor warrants to the Contracting Authority and Owner that all materials and equipment furnished under the Contract shall be new and of good quality unless otherwise required or permitted by the Contract Documents, that the Work shall be free from defects not inherent in the quality required or permitted, and that the Work shall conform to the requirements of the Contract Documents. Work not conforming to those requirements, including Substitutions not properly approved and authorized is Defective Work. If required by the A/E, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

6.21.2 If the Contractor or a Subcontractor recommends a particular product, material, system, or item of equipment for incorporation into the Project and the Owner accepts that recommendation, the above warranty includes a warranty from the Contractor to the Owner that the recommended product, material, system, or item of equipment is fit and appropriate for the associated purpose.

6.22 Additional Tests and Inspections

6.22.1 If before or after Substantial Completion the A/E or the Contracting Authority determines that any portion of the Work requires special inspection, testing, or approval not otherwise required under the Contract Documents, the A/E shall order such inspection, testing, or approval.

6.22.1.1 If the special inspection, testing, or approval reveals Defective Work, the Contractor shall pay all associated costs and will not be entitled to any related adjustment of the Contract Times. Those costs may include, but are not limited to:

- **.1** the cost of the special inspection, testing, or approval;
- **.2** the cost of conducting the special inspection, testing, or approval on similar Work regardless of whether the similar Work is also revealed as Defective Work;
- **.3** the cost of additional special inspections, testing, or approvals to evaluate remedial Work;
- **.4** the cost of correcting the Defective Work; and
- **.5** all related Owner-incurred fees and charges of contractors, engineers, architects, attorneys, and other professionals.

6.22.1.2 The Contracting Authority may deduct the costs described under **Section 6.22.1.1** from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.22.1.3 If the special inspection, testing, or approval reveals that the Work complies with the Contract Documents, and the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of the special inspection, testing, or approval, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6**, and **(2)** within the time period required under **Section 7.6** which begins to run on the day of the special inspection, testing, or approval.

6.22.2 If the Contractor is aware of a need for inspection, testing, or approval, or of a need to have any inspection, testing, or approval completed by a particular time to avoid delay, then the Contractor shall timely communicate such information to the A/E and Contracting Authority.

6.22.3 Except as described under **Section 6.22.1**, the Owner shall pay for any inspection, testing, or approval that did not become a requirement until after it awarded the Contract.

6.22.4 The Contractor shall coordinate with and give the A/E, Contracting Authority, and Owner reasonable notice of the anticipated dates of all inspections, testing, or approvals.

6.22.5 Within five days after completion of an inspection, testing, or approval, the A/E shall provide an original report/certificate of the inspection, testing, or approval to the Contractor and Contracting Authority with a recommendation for or against acceptance of the results therein.

6.23 Uncovering the Work

6.23.1 If the Contractor covers Work contrary to the requirements of the Contract Documents or contrary to the written request of the Contracting Authority or A/E, the Contractor shall, if the Contracting Authority or A/E requests in writing, uncover that Work for observation, correct it if not in conformity with the Contract Documents, and recover it at the Contractor's expense without adjustment of the Contract Times.

6.23.2 If the Contractor covers Work in accordance with the Contract Documents and not contrary to a request from the A/E or Contracting Authority for an opportunity to observe the Work prior to covering, the Contractor shall, if the A/E requests in writing, uncover that Work.

6.23.2.1 If the uncovered Work is Defective Work, the Contractor shall pay the costs of uncovering, correcting, and recovering the Work and shall not be entitled to an adjustment of the Contract Times.

6.23.2.2 If the uncovered Work is not Defective Work and the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of the uncovering and recovering of the Work, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6**, and **(2)** within the time period required under **Section 7.6** which begins to run on the day that the Contracting Authority or A/E observes the uncovered Work.

6.24 Correction of the Work

6.24.1 Before Substantial Completion.

6.24.1.1 If the Contractor provides Defective Work or fails or neglects to perform the Work in accordance with the Construction Progress Schedule, the Contracting Authority or A/E may issue a written notice to the Contractor and Contractor's Surety directing the Contractor to correct the Defective Work or recover schedule deficiencies. Unless otherwise specified in that written notice, the Contractor shall promptly commence and diligently pursue correction of the Defective Work and recovery of schedule deficiencies within three days after the Contracting Authority issues the written notice ("72-Hour Notice").

6.24.1.2 If the Contractor fails to promptly commence and diligently pursue correction of the Defective Work and recovery of schedule deficiencies required under **Section 6.24.1.1**, the Owner may correct the Defective Work or take action to recover schedule deficiencies without giving further notice to the Contractor or Contractor's Surety.

6.24.2 After Substantial Completion.

6.24.2.1 In addition to the Contractor's other obligations under the Contract Documents, if any of the Work is found to be Defective Work after Substantial Completion, the Contractor shall correct it promptly after receipt of written notice from the A/E, Contracting Authority, or Owner to do so, unless the Contracting Authority and Owner have previously acknowledged and accepted the Defective Work in writing as described under **Section 6.25.1**. The A/E, Contracting Authority, or Owner may send a copy of the written notice to the Contractor's Surety, but are not obligated to do so.

6.24.2.2 During the Correction Period. If the Contracting Authority or Owner issues a notice under **Section 6.24.2.1** during the Correction Period, the Owner may correct the Defective Work itself without giving further notice to the Contractor or Contractor's Surety if the Contractor fails to **(1)** notify the Owner in writing of the Contractor's intent to correct the Defective Work within seven days after the Contracting Authority or Owner issues the notice and **(2)** thereafter promptly commence and diligently pursue correction of Defective Work.

6.24.2.3 The Correction Period:

.1 commences on the date of Substantial Completion of the Work or a designated portion of the Work which the Contracting Authority and Owner have agreed to take Partial Occupancy;

.2 relates only to the Contractor's specific obligation and opportunity to correct the Work during the Correction Period;

.3 does not establish a period of limitation with respect to any of the Contractor's other obligations under the Contract Documents;

.4 has no relationship to the time within which the State or Owner may seek to enforce the Contract;

.5 does not establish a period of limitation within respect to the commencement of litigation to establish the Contractor's liability under the Contract or otherwise; and

.6 shall not be extended by corrective Work performed by the Contractor under this **Section 6.24.2**.

6.24.2.4 After the Correction Period. If the Owner issues a notice under **Section 6.24.2.1** after expiration of the Correction Period, the Owner may correct the Defective Work without giving further notice to the Contractor or Contractor's Surety if the Contractor fails to **(1)** notify the Owner in writing of the Contractor's intent to correct the Defective Work within 14 days after the Owner issues the notice and **(2)** thereafter promptly commence and diligently pursue correction of Defective Work.

6.24.3 Emergency Correction of Defective Work.

6.24.3.1 Notwithstanding any other provision of the Contract to the contrary, if in the Contracting Authority's or Owner's opinion the Defective Work presents a threat of imminent harm or danger to people, property, or the environment, the Contracting Authority or Owner may order the Contractor to immediately correct Defective Work or the Owner may correct the Defective Work itself without any prior notice to the Contractor or Contractor's Surety.

6.24.4 Responsibility for Costs of Correction.

6.24.4.1 The Contractor shall pay all of the costs and damages associated with the correction of Defective Work and the recovery of schedule deficiencies under this **Section 6.24**. Those costs and damages may include, but are not limited to, the related fees and charges of contractors, engineers, architects, attorneys, and other professionals; and the cost of correcting or replacing adjacent work. The Contracting Authority may deduct those costs and damages from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.25 Acceptance of Defective Work

6.25.1 Before final Contract Completion, the Owner may accept any Defective Work instead of requiring its removal or correction, in which case the Contract Sum shall be equitably reduced as described under **Article 7**.

6.25.1.1 The Owner may only accept Defective Work through a deduct Change Order that makes explicit reference to this **Section 6.25**.

6.25.1.2 After final Contract Completion, the Owner may only accept Defective Work by giving written notice to the Contractor that the Owner is accepting the associated Defective Work.

6.25.2 None of the following will constitute **(1)** acceptance of Defective Work, **(2)** a release of the Contractor's obligation to perform the Work in accordance with the Contract, or **(3)** a waiver of any rights set forth in the Contract or otherwise provided by Applicable Law:

6.25.2.1 observations or inspections by the Owner, Contracting Authority, or A/E;

6.25.2.2 the making of any payment;

6.25.2.3 Substantial Completion or the issuance of a Certificate of Substantial Completion;

6.25.2.4 Partial Occupancy and the Owner's use or occupancy of the Work or any part of it;

6.25.2.5 Contract Completion or the issuance of a partial or final Certificate of Contract Completion;

6.25.2.6 any review or approval of a submittal;

6.25.2.7 any inspection, test, or approval by other Persons; or

6.25.2.8 any correction of Defective Work by the Owner.

6.26 Project Document Maintenance and Submittal

6.26.1 During Construction.

6.26.1.1 The Contractor shall maintain in good order at a secure location on the Site:

.1 a complete copy of all Contract Documents; Shop Drawings, Product Data, Samples and similar required submittals; manufacturer operating and maintenance instructions; certificates; warranties; RFIs and responses thereto; and other Project-related documents, all marked currently and accurately to record field changes and selections made during construction and to show actual installation where installation varies from Work as originally shown, including the exact location and depth of underground utility lines; and

.2 a set of Drawings and Specifications, approved in accordance with **Section 5.2.1.1**, and the records required by **Section 6.2.14**.

6.26.1.2 Before submitting each Contractor Payment Request, the Contractor shall record all changes on the Contract Documents, neatly in a contrasting color, noting new information not shown on the original Contract Documents. Failure to record all changes may cause payment to be withheld or delayed by the Contracting Authority.

6.26.1.3 The Contractor shall keep a record of changes made to the Specifications, noting particularly any approved variation from manufacturers' installation instructions and recommendations.

6.26.1.4 If the Contractor uses Shop Drawings to indicate as-built conditions, the Contractor shall cross-reference the Shop Drawing sheet numbers to the corresponding sheet numbers on the Contract Documents. The Contractor shall note related numbers where applicable.

6.26.1.5 The Contractor shall at all times permit access to the documents described in this **Section 6.26.1** to authorized representatives of the State, local authorities with jurisdiction over the Project, Contracting Authority, Owner, and A/E.

6.26.2 Before Contract Completion.

6.26.2.1 As a condition precedent to execution of the Certificate of Contract Completion and final payment, the Contractor shall submit to the A/E:

.1 all LEED-related documents not previously submitted (if applicable); and

.2 the As-Built Documents including one electronic version and one hard-copy version organized into suitable sets of manageable size bound with durable cover sheets and appropriate identification marked on the front and the spine of each binder.

6.26.2.2 The Contractor's As-Built Documents submission shall include, but is not limited to:

.1 Certificate of Occupancy;

.2 inspection certificates for pressure piping, elevator, boiler, electrical, plumbing or piping purification, etc.;

.3 Letter of Approval from the local fire authority or State Fire Marshal for the fire suppression system;

.4 Operation and Maintenance Manuals;

.1 The Contractor shall organize the hard copy of the Operation and Maintenance Manuals into suitable sets of manageable size, and include indexed data bound in individual binders, with pocket folders for folded sheet information.

.5 neatly and accurately marked sets of As-Built Documents, and other Contract Documents reflecting the actual construction of the Project;

.6 detailed Drawings reflecting the exact location of any concealed utilities, mechanical or electrical systems, and components;

.7 assignment to the Owner of all warranties and guarantees, including the most-recent address and telephone number of any Subcontractors or manufacturers.

6.26.2.3 By submitting the As-Built Documents to the A/E, the Contractor certifies that its As-Built Documents are complete, correct, and accurate.

6.26.3 Record Documents.

6.26.3.1 The A/E shall revise the original Contract Documents and related Electronic Files with the information contained on the As-Built Documents. The A/E shall label the revised original Contract Documents and related Electronic Files as "Record Documents" and reflect the date of the A/E's incorporation of the As-Built Documents.

6.26.3.2 The Owner may thereafter use the Record Documents for any purpose relating to the Project including, but not limited to, additions to or completion of the Project.

6.27 Final Cleaning

6.27.1 Before requesting the Substantial Completion inspection of the Work, the Contractor shall clean the Site, remove waste materials and rubbish attributable to the Project, and restore the property to its original condition so that upon Substantial Completion, the premises are ready for occupancy by the Owner.

6.27.2 If the Contractor performs any Work after final cleaning, the Contractor shall clean the affected area as provided above so that upon Substantial Completion, the premises are ready for occupancy by the Owner.

6.27.3 Final cleaning shall be done to the reasonable satisfaction of the A/E and Contracting Authority.

6.28 Substantial Completion

6.28.1 Contractor's Punch List.

6.28.1.1 When the Contractor considers the Work, or a designated portion thereof, Substantially Complete the Contractor shall inspect the Work and prepare a list of Defective Work and incomplete or unacceptable Work ("Contractor's Punch List"). The Contractor shall list all items of Work not in compliance with the Contract Documents, including items the Contractor is requesting to be deferred.

.1 The Contractor shall proceed to correct all items listed on the Contractor's Punch List and certify that the incomplete items listed on the Contractor's Punch List are to its knowledge an accurate and complete list by signing the Contractor's Punch List.

.2 The Contractor's failure to include an item on the Contractor's Punch List shall not alter the Contractor's responsibility to complete the Work in accordance with the Contract Documents.

.3 The Contractor shall submit the signed Contractor's Punch List to the A/E, together with a request for the Substantial Completion inspection of the Work.

6.28.2 Substantial Completion Inspection.

6.28.2.1 Within three business days after receipt of the request for the Substantial Completion inspection of the Work, the A/E shall notify the Contractor of acceptance or rejection of the request, stating reasons for any rejection.

.1 Within seven days after its acceptance of the Contractor's request, the A/E shall conduct the Substantial Completion inspection to determine whether the Work, or designated portion, is in conformity with the Contract Documents and Substantially Complete. The A/E shall notify the Contractor, Contracting Authority, and Owner of the scheduled time of the inspection.

.2 If the A/E determines that the Work is Substantially Complete, within three business days after the Substantial Completion inspection, the A/E shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion and include a list of Defective, incomplete, or unacceptable Work ("A/E's Punch List"). The A/E's Punch List shall include **(1)** the items on the Contractor's Punch List that are not yet completed or corrected as of the date of the Substantial Completion inspection, and **(2)** comments from the Contracting Authority and Owner.

.3 The A/E shall submit the Certificate of Substantial Completion to the Contracting Authority, Owner, and Contractor for their written acceptance. Upon their acceptance and consent of the Contractor's Surety, and subject to the Owner's right to withhold payment, the Owner shall release retainage as described under **Section 9.6.1**.

.4 The A/E's failure to include an item on the A/E's Punch List shall not alter the Contractor's responsibility to complete the Work in accordance with the Contract Documents.

.5 If the A/E accepts the request for the Substantial Completion inspection and subsequently determines that the Work is not Substantially Complete, the A/E may request compensation for expenses related to excessive Punch List activities. The Contracting Authority may deduct that additional compensation to the A/E from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.28.3 Completion of Punch List Items.

6.28.3.1 Before expiration of the Punch List Milestone and before the date of Final Contract Completion, the Contractor shall complete all items on the A/E's Punch List. After completing all items on the A/E's Punch List, the Contractor shall provide a written request for Final Inspection of the Work to the A/E.

.1 If Work on the A/E's Punch List cannot be timely completed, the Contractor shall justify in writing to the reasonable satisfaction of the Contracting Authority and A/E, the reasons the items cannot be completed, and the Contractor may propose, for the Contracting Authority and A/E's approval, an adjustment of the

Punch List Milestone for the associated Punch List items to establish a time when the Contractor shall complete those items.

.2 Within three business days after receipt of the Contractor's request for the Final Inspection, the A/E shall complete a Final Inspection of the Work for compliance with the Contract Documents.

.3 If multiple inspections of items on the A/E's Punch List are required due to the Contractor's failure to properly and timely complete them, the Contractor shall pay any additional costs incurred by the A/E, Owner, and Contracting Authority resulting from any attendant delay and re-inspections. The Contracting Authority may deduct those additional costs from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.29 Partial Occupancy

6.29.1 The Owner may occupy or use a portion of the Project prior to Substantial Completion of all Work if:

6.29.1.1 the building authority with jurisdiction over the Project issues a partial certificate of occupancy for the portion of the Project the Owner intends to occupy (if applicable);

6.29.1.2 the Owner with the Contractor's and A/E's assistance has provided written notice of the Partial Occupancy to the insurers providing builder's risk property insurance for the Project; and

6.29.1.3 the Contracting Authority has received notice of the Partial Occupancy from the A/E and has consented to it.

6.29.2 Before the Owner commences Partial Occupancy, the Owner, Contracting Authority, A/E, and Contractor shall proceed as described under **Section 6.28** for the area designated for Partial Occupancy. The Owner may commence Partial Occupancy before the Contractor has achieved Substantial Completion of the area designated for Partial Occupancy.

6.29.3 The Contractor shall be relieved of the obligation to maintain the area accepted for Partial Occupancy, but shall remain obligated to complete and correct the Work and to carry the insurance required by the Contract Documents during performance of any such Work.

6.30 Demonstration and Training, Operating Appurtenances

6.30.1 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and final payment, shall perform demonstration and training of the Owner's maintenance personnel as specified in the Contract Documents.

6.30.2 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and final payment, shall organize and submit operating appurtenances and loose items related to operation and maintenance of the completed Project to the Owner, including, but not limited to:

6.30.2.1 keys to door and window hardware, panels, and other devices not directly provided to the Owner from the manufacturer;

6.30.2.2 operating handles, levers, cranks, specialized wrenches or drivers, remote controls, and similar items; and

6.30.2.3 extra materials (e.g., attic stock).

6.31 Contract Completion

6.31.1 Partial Contract Completion.

6.31.1.1 When items of Work cannot be completed until a subsequent date, the A/E shall prepare a partial Certificate of Contract Completion that shall include a detailed list of the deferred Work and the date(s) by which the Contractor will complete that Work.

6.31.1.2 The A/E shall submit the partial Certificate of Contract Completion to the Contracting Authority, Owner, and Contractor for their written acceptance. After they accept the partial Certificate of Contract Completion and the Contractor has submitted the Contractor's Surety's consent to payment, the Contracting Authority may release payment to the Contractor in the Contracting Authority's sole discretion.

6.31.2 Final Contract Completion.

6.31.2.1 When all items on the A/E's Punch List have been completed to the satisfaction of the A/E, all requirements of the Contract Documents have been completed, and the provisions of **Sections 6.26** through **6.30** have been fulfilled, the A/E shall prepare and recommend execution of a final Certificate of Contract Completion.

The date that the Contracting Authority executes the final Certificate of Contract Completion is the date of Contract Completion.

6.31.2.2 Within 30 days after the Contracting Authority executes the final Certificate of Contract Completion, the Contracting Authority will make final payment to the Contractor of all remaining funds then due and payable including any funds retained following Substantial Completion as described under **Section 9.7**.

ARTICLE 7 - MODIFICATIONS

7.1 General

7.1.1 Changes in the Work.

7.1.1.1 The Contracting Authority may order changes in the Work without invalidating the Contract. Subject to the limitations stated in this **Article 7** and elsewhere in the Contract Documents, a change in the Work may be accomplished by a Change Order, Change Directive, or order for a minor change in the Work.

- **.1** The Contractor shall proportionately increase the amount of the Bond whenever the Contract Sum is increased.
- **.2** If notice of any change affecting the Contract is required by the provision of any Bond, notice is the Contractor's responsibility, and the amount of each applicable Bond shall be adjusted accordingly.

7.1.1.2 The Contractor shall not proceed with any change in the Work without the Contracting Authority's prior written authorization except as provided under **Sections 1.10** and **7.4**.

7.1.1.3 Except as provided in **Section 1.10**, the Contractor's failure to obtain prior written authorization for a change in the Work will prejudice the Owner and Contracting Authority and constitute a waiver by the Contractor of any adjustment to the Contract Sum or Contract Times, or both, for the related Work.

7.1.1.4 The Contractor shall perform all changes in the Work under the applicable provisions of the Contract Documents, and the Contractor shall proceed promptly with the change unless otherwise provided in the Change Order, Change Directive, or order for a minor change in the Work

7.1.2 Paperwork Consolidation.

7.1.2.1 Related Modifications, with the same or similar justification (e.g., Owner Request or field resolution), may be consolidated into the same Change Order.

7.1.2.2 Add and deduct Modifications, with the same or similar justification, may be included on the same Change Order.

7.1.2.3 Modifications resulting from errors or omissions shall not be combined with other modifications for which the A/E will receive a fee.

7.1.3 Modification Numbering.

7.1.3.1 The A/E shall assign a number to each Modification, which shall uniquely identify it.

7.1.3.2 The A/E shall not duplicate or reuse any number throughout the Project or reuse assigned numbers for Proposal Requests that are initiated but cancelled in process.

7.1.3.3 The number for each Change Order shall be coordinated with any associated Proposal Request, Change Request, or Change Directive.

7.1.4 Modification Log.

7.1.4.1 The A/E shall create and maintain a Modification Log for the Project, which shall contain the following minimum information:

- **.1** number of the Modification;
- **.2** a brief description of the Modification;
- **.3** cost of the Modification;
- **.4** schedule impact of the Modification; and
- **.5** dates sent to, and received from, the parties.

7.1.5 Reconciliation of Unit Price Items.

7.1.5.1 The Contracting Authority may increase, decrease, or delete entirely the scheduled quantities of Unit Price Work.

7.1.5.2 If the actual quantity of a Unit Price item exceeds or appears that it will exceed the scheduled quantity, the Contractor shall immediately notify the A/E in writing. The A/E, after consulting with the Contracting Authority, will issue a Change Order or Change Directive to authorize an adjustment of the scheduled quantity or to otherwise address the excess.

7.1.5.3 If the actual quantity of a Unit Price item differs from the scheduled quantity by 20 percent or more, so that application of the Unit Price to the quantities of Work performed or reasonably expected to be performed would create an undue hardship on either the Owner or Contractor:

.1 the Contractor shall initiate a Change Request seeking an adjustment of the Unit Price **(1)** as required under **Section 7.6**, and **(2)** within the time period required under **Section 7.6** which begins to run on the day that the Contractor knew or should have known that the actual quantity of a Unit Price item would differ from the scheduled quantity by 20 percent or more; or

.2 the A/E, after consulting with the Contracting Authority, will issue a Change Directive to adjust the Unit Price.

7.1.5.4 If a Unit Price is adjusted as described under **Section 7.1.5.3**, the new Unit Price will only apply to the units of Work performed that are **(1)** less than the 20 percent threshold if the Unit Price is changed on account of an over-estimation of the scheduled quantity of a Unit Price item involved in the Work or **(2)** in excess of the 20 percent threshold if the Unit Price is changed on account of an under-estimation of the scheduled quantity of a Unit Price item involved in the Work.

7.1.5.5 Before final payment, the A/E shall issue a Change Order to reconcile any difference between the scheduled and actual quantities of Unit Price Work performed and materials furnished.

7.1.5.6 Notwithstanding **Section 7.1.5.3**, if the actual quantity of any item of Unit Price Work is zero, there shall be no adjustment of the Unit Price.

7.1.6 Notice of Credits and Schedule Reductions.

7.1.6.1 Notwithstanding any other provision of the Contract to the contrary, the Contractor shall promptly notify the Contracting Authority, Owner, and A/E in writing whenever any change in the Project (including without limitation through an order for a minor change in the Work) may entitle the Owner to a credit from the Contractor or a reduction of the time for completion of the Project.

7.2 Change Orders

7.2.1 A Change Order is a written instrument prepared by the A/E and executed by the Contracting Authority, Owner, and Contractor, stating their agreement upon all of the following:

7.2.1.1 a change in the Work;

7.2.1.2 the amount of the adjustment of the Contract Sum, if any; and

7.2.1.3 the extent of the adjustment of the Contract Times, if any.

7.2.2 Except with the Contracting Authority's written consent as explicitly provided under **Sections 7.3.9**, **7.3.10**, **7.6.2**, and **7.6.3**, the Contractor is not entitled to reserve any rights or take other similar action with respect to a Change Order if the effect or intent of the reservation or action would be to accommodate a further adjustment of the Contract Sum or Contract Times, or both, after the Contractor signs the Change Order. By signing a Change Order, the Contractor irrevocably certifies that the elements of a Change Order described in **Section 7.2.1** are completely and fully satisfied, and waives all rights, if any, to seek further adjustment of the Contract Sum or Contract Times, or both, at a later date with respect to the associated change in the Work including without limitation on account of **(1)** the "cumulative impact" of the associated change in the Work in combination with one or more other changes in the Work; **(2)** all costs, including interest on those costs; and **(3)** any delays, inefficiencies, disruptions, suspensions, extended overhead, and acceleration.

7.2.3 The A/E shall prepare each Change Order form, attach the supporting documentation, and issue the Change Order to the Contractor for signature.

7.2.4 If the Contractor is in agreement with the Change Order under **Section 7.2.1**, the Contractor shall sign and return the Change Order to the A/E within three days after receiving it.

7.2.5 When the A/E receives the Change Order signed by the Contractor, the A/E will recommend approval by signing the form and transmitting the Change Order and the revised Change Order Log to the Owner.

7.2.6 When the Owner receives the Change Order, the Owner may sign the form accepting the Change Order, attach certification of funding, and transmit the Change Order to the Contracting Authority; or, if the Owner does not accept the Change Order, the Owner will reject and return it to the A/E.

7.2.7 When the Contracting Authority receives the Change Order, the Contracting Authority may sign the form approving the Change Order, and transmit the fully executed Change Order to all signers; or, if the Contracting Authority does not accept the Change Order, the Contracting Authority will reject and return it to the A/E.

7.2.8 When the Change Order is signed by the Contractor, A/E, Owner, and Contracting Authority, the fully executed Change Order modifies the Contract Documents and authorizes and directs the Contractor to proceed, and the Contractor shall promptly proceed with the associated change in the Work.

7.3 Change Directives

7.3.1 A Change Directive is a written order prepared by the A/E and executed by the Contracting Authority and Owner directing a change in the Work or the performance of disputed Work as described under **Section 7.3.4.1**.

7.3.1.1 The parties will endeavor to resolve each Change Directive through the Field Meeting described under **Section 7.7**.

7.3.2 Through a Change Directive, the Contracting Authority may:

7.3.2.1 propose a basis for adjustment, if any, in the Contract Sum or Contract Times, or both; or

7.3.2.2 limit the scope of the change in the Work on a time and materials basis, not to exceed a fixed adjustment of the Contract Sum.

7.3.3 If a change in the Work must start immediately to avoid an imminent impact to the schedule of the Project, the A/E may prepare a Change Directive for the Contracting Authority's and the Owner's signatures pursuant to **Section 7.3.1**, authorizing the Contractor to proceed.

7.3.4 A Change Directive shall be used to direct a change in the Work in the absence of total agreement on the terms of a Change Order.

7.3.4.1 For the purposes of clarity, the Contract refers to a Change Directive as if it is only to be used in the absence of total agreement on the terms of a Change Order concerning the associated change of the Work. A Change Directive may also be used in the absence of agreement as to whether the subject of the Change Directive actually constitutes a change in the Work; such as but not limited to the situations described under **Sections 6.9.2** and **7.4.3**.

7.3.5 Upon receipt of a Change Directive, the Contractor shall promptly proceed with the change in the Work involved.

7.3.6 If the Change Directive contains a proposed basis for adjustment of the Contract Sum or Contract Times, or both, within ten days after receiving it, the Contractor may sign the Change Directive to accept the proposed basis for adjustment, and return it to the A/E. Thereafter, the A/E shall prepare and the A/E, Contracting Authority, Owner, and Contractor shall promptly execute an associated Change Order as described under **Section 7.2**.

7.3.7 Within ten days after receiving the Change Directive, or other period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the A/E and Contracting Authority a Proposal meeting the requirements of **Section 7.5** for adjustment of the Contract Sum or Contract Times, or both, on account of the change, unless the Change Directive is performed on a time and materials basis under **Section 7.3.2.2**. If the Change Directive is performed on a time and materials basis, the Contractor shall submit its Proposal within ten days after completing the changed Work, which is the subject of the Change Directive.

7.3.8 If the Contractor does not respond to a Change Directive as and when required under **Section 7.3.6** or **Section 7.3.7 (1)** the Contracting Authority shall determine the adjustments, if any, of the Contract Sum and Contract Times and issue its determination to the Owner, A/E, and Contractor, and **(2)** the A/E shall prepare a Change Order consistent with that determination and issue it to the Contractor as described under **Section 7.2.3**. If the Contractor does not agree with the Contracting Authority's determination, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.3.9 Pending final determination of the total adjustment of the Contract Times on account of a Change Directive, to the extent that the Contracting Authority, Owner, and Contractor agree on a portion of the adjustment of the Contract Times, that the period of time not in dispute may be included in the Construction Progress Schedule accompanied by a Change Order indicating the parties' agreement with only that portion of the time adjustment.

7.3.10 Pending final determination of the total adjustment of the Contract Sum on account of a Change Directive, to the extent that the Contracting Authority, Owner, and Contractor agree on a portion of the adjustment of the Contract Sum, the amount not in dispute for that change in the Work may be included in a Contractor Payment Request accompanied by a Change Order indicating the parties' agreement with only that portion of the cost adjustment.

7.3.11 If the Contracting Authority, Owner, and Contractor agree on the adjustments of the Contract Sum and Contract Times associated with a Change Directive, the A/E shall prepare an appropriate Change Order. The A/E, Contracting Authority, Owner, and Contractor shall sign the Change Order as described under **Section 7.2**.

7.3.12 If the Contracting Authority, Owner, and Contractor do not agree on the adjustments of the Contract Sum and Contract Times associated with a Change Directive, **(1)** the Contracting Authority shall determine the adjustments, if any, of the Contract Sum and Contract Times and issue its determination to the Owner, A/E, and Contractor, and **(2)** the A/E shall prepare a Change Order consistent with that determination and issue it to the Contractor as described under **Section 7.2.3**. If the Contractor does not agree with the Contracting Authority's determination, the Contractor shall initiate a Claim as and when required under **Article 8.**

7.3.13 The Contracting Authority may at any time reject the Contractor's Proposal submitted under **Section 7.3.7**. If the Contractor does not agree with the Contracting Authority's rejection, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.3.14 If a Change Directive or portion of a Change Directive remains pending or otherwise unresolved 60 days after the date on which the Change Directive was issued, the associated Contractor's Proposal or portion of the Contractor's Proposal still pending will be deemed rejected by the Contracting Authority. If the Contractor does not agree with the deemed rejection, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.3.15 The Contractor's failure to comply with the requirements of this **Section 7.3** will constitute an irrevocable waiver of the Contractor's Proposal and any related Claim.

7.4 Minor Changes in the Work

7.4.1 The A/E may order minor changes in the Work not involving adjustment of the Contract Sum or extension of the Contract Times and not inconsistent with the intent of the Contract Documents. Those changes shall be effected by written order issued to the Contractor.

7.4.2 The Contractor shall promptly carry out each order for a minor change in the Work if the Contractor agrees that the order does not involve adjustment of the Contract Sum or Contract Times, or both.

7.4.3 If the Contractor reasonably believes that it would be entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of an order for a minor change in the Work, the Contractor, within five business days after receiving the order, shall give the Contracting Authority and A/E written notice of the Contractor's position, and not proceed with the subject Work without first receiving a Change Directive or Change Order related to it.

7.4.4 The Contractor waives its right to an adjustment of the Contract Sum or Contract Times on account of an order for a minor change in the Work by:

7.4.4.1 starting the Work that is the subject of the order for a minor change in the Work; or

7.4.4.2 failing to give the notice described under **Section 7.4.3** within five business days after receiving the order for a minor change in the Work.

7.5 Proposal Requests and Contractor Proposals

7.5.1 Proposal Requests. The A/E shall prepare and issue a Proposal Request to the Contractor to obtain the Contractor's Proposal for the adjustment of the Contract Sum or Contract Times, or both, associated with a contemplated change in the Work.

7.5.1.1 The Contractor shall respond with a Proposal to the A/E and Contracting Authority within ten days after receiving the Proposal Request. The allowable time for the Contractor's response may be extended by written agreement of the Contractor and A/E.

7.5.1.2 If the Contractor does not submit a Proposal within the time required in **Section 7.5.1.1**, the Contractor waives its right to an adjustment of the Contract Sum or Contract Times, or both, associated with the contemplated change in the Work.

7.5.1.3 A Proposal Request does not authorize the Contractor to proceed with a change in the Work.

7.5.2 Contractor Proposals in General.

7.5.2.1 In any Proposal for an adjustment of the Contract Sum, the Contractor shall specifically identify the items set forth in **Section 7.8**. By submitting a Proposal for an adjustment of the Contract Sum, the Contractor represents to the Contracting Authority and Owner that the proposed adjustment is the entire adjustment of the Contract Sum to which the Contractor is entitled on account of the associated change or proposed change in the Work.

7.5.2.2 In any Proposal for an adjustment of the Contract Times, the Contractor shall specifically identify the items set forth in **Section 7.9**. By submitting a Proposal for an adjustment of the Contract Times, the Contractor represents to the Contracting Authority and Owner that the proposed adjustment is the entire adjustment of the Contract Times to which the Contractor is entitled on account of the associated change or proposed change in the Work.

7.5.2.3 The Contractor shall hold every Proposal valid and open for acceptance for at least 45 days. The acceptance period may be adjusted by mutual consent of the Contractor and Contracting Authority.

7.5.2.4 A Proposal may be accepted by the Contracting Authority and Owner only through a Change Order.

7.5.2.5 The Contractor's cost of preparing and providing Proposals is included in the Contract Sum and shall not be included in any cost or credit determination under the Contract.

7.5.3 Contractor Proposals Related to Change Requests. In addition to complying with **Section 7.5.2**, if the Proposal relates to a Change Request, the Contractor shall include in the Proposal the following information to permit timely and appropriate evaluation of the Change Request, determination of responsibility, and opportunity for mitigation:

7.5.3.1 if applicable, the Contractor's planned actions to mitigate costs and delays by avoiding interference, disruption, hindrance, delay, or impact;

7.5.3.2 recommended action to mitigate costs and delays by avoiding interference, disruption, hindrance, delay, or impact; and

7.5.3.3 additional information **(1)** the Contracting Authority requests or **(2)** the Contractor believes is relevant to resolution of the Change Request.

7.6 Change Requests

7.6.1 The Contractor shall initiate a change in the Work by submitting to the Contracting Authority and A/E a Change Request accompanied by a Proposal meeting the requirements of **Section 7.5** within ten days after the occurrence of the event giving rise to the Change Request.

7.6.1.1 The parties will endeavor to resolve each Change Request through the Field Meeting described under **Section 7.7**.

7.6.2 Pending final determination of the total adjustment of the Contract Times on account of a Change Request, to the extent that the Contracting Authority, Owner, and Contractor agree on a portion of the adjustment of the Contract Times, that period of time not in dispute may be included in the Construction Progress Schedule accompanied by a Change Order indicating the parties' agreement with only that portion of the time adjustment.

7.6.3 Pending final determination of the total adjustment of the Contract Sum on account of a Change Request, to the extent that the Contracting Authority, Owner, and Contractor agree on a portion of the adjustment of the Contract Sum, the amount not in dispute for that change in the Work may be included in a Contractor Payment Request accompanied by a Change Order indicating the parties' agreement with only that portion of the cost adjustments.

7.6.4 If the Contracting Authority, Owner, and Contractor agree on the adjustments of the Contract Sum and Contract Times associated with a Change Request, the A/E shall prepare an appropriate Change Order. The A/E, Contracting Authority, Owner, and Contractor shall sign the Change Order as described under **Section 7.2**.

7.6.5 If the Contracting Authority, Owner, and Contractor do not agree on the adjustments of the Contract Sum and Contract Times associated with a Change Request, **(1)** the Contracting Authority may determine the adjustments, if any, of the Contract Sum and Contract Times and issue its determination to the Owner, A/E, and Contractor, and **(2)** the A/E shall prepare a Change Order consistent with that determination and issue it to the Contractor as described under **Section 7.2.3**. If the Contractor does not agree with the Contracting Authority's determination, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.6.6 The Contracting Authority may at any time reject the Contractor's Change Request and Proposal submitted under **Section 7.6.1**. If the Contractor does not agree with the Contracting Authority's rejection, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.6.7 If a Change Request or portion of a Change Request remains pending or otherwise unresolved 60 days after the date on which the Change Request was submitted, the Change Request or portion of the Change Request still pending will be deemed rejected by the Contracting Authority. If the Contractor does not agree with the deemed rejection, the Contractor shall initiate a Claim as and when required under **Article 8**.

7.6.8 The Contractor's failure to comply with the requirements of this **Section 7.6** will constitute an irrevocable waiver of the Change Request and any related Claim.

7.7 Field Meeting

7.7.1 The Contracting Authority, Owner, and Contractor shall meet to review and endeavor to resolve **(1)** a Change Directive within 14 days after the Contracting Authority and Owner issue it under **Section 7.3.1** and **(2)** a Change Request within seven days after the Contractor initiates it under **Section 7.6.1**.

7.7.2 Notwithstanding **Section 7.7.1**:

7.7.2.1 a Field Meeting is not a condition precedent to the exercise of any right or the performance of any obligation under the Contract;

7.7.2.2 whether and when a Field Meeting is convened does not alter any right or any obligation under the Contract; and

7.7.2.3 the Contracting Authority, Owner, and Contractor may convene a Field Meeting at any time to address and attempt to resolve any pending Change Directive, Change Request, or other matter.

7.8 Change Order Cost or Credit Determination

7.8.1 General.

7.8.1.1 The maximum cost or credit resulting from a change in the Work shall be determined as described below.

.1 Proposals shall include the information required by **Section 7.8.1.4**.

.2 A Unit Price Proposal shall only be valid when incorporated into the Contract by Change Order except for Unit Price Work included in the Contract.

.3 The maximum cost or credit includes all compensation for impact costs. Additional costs for impacts shall not be allowed.

7.8.1.2 The Contractor shall not assign any portion of the Work to another Person whereby the Contractor would benefit directly or indirectly from the double application of charges for overhead or profit.

Example: Assume that **(1)** the Contractor is or is capable of self-performing general trades Work and **(2)** the change in the Work includes both electrical trade Work and general trades Work. The Contractor may not assign the general trades Work to the Contractor's electrical Subcontractor and then perform that general trades Work as a sub-subcontractor to the Contractor's electrical Subcontractor.

7.8.1.3 The Contracting Authority may require notarized invoices for material costs and may audit the records of the Contractor and Subcontractors.

7.8.1.4 For each change in the Work, the Contractor shall furnish a detailed Proposal itemized on the **Proposal Worksheet Summary Form (Contractor)** published by the Ohio Facilities Construction Commission through which the Contractor shall document the related changes in the Contract Sum as described under **Section 7.8.2**. Any Subcontractor pricing shall be itemized on the appropriate **Proposal Worksheet Summary Form**.

.1 The Contractor's cost of preparing and providing Proposals is included in the Contract Sum and shall not be included in any cost or credit determination under the Contract.

7.8.1.5 Section 7.8.2 establishes the exclusive and maximum amount that the Owner shall pay for any change in the Work, including, but not limited to, all amounts for interference with, delay, hindrance, disruption of, or impact on the Work ("Pricing Criteria"). These Pricing Criteria also govern the value of deduct Change Orders and the Contractor's entitlement to additional compensation or damages through the Change Directive, Change Request, Claims, and dispute resolution processes on account of changes in the Work. In order to expedite the review and approval process, Proposals shall be prepared in the categories and order listed in **Section 7.8.2**.

7.8.2 Pricing Criteria.

7.8.2.1 Contractor Personnel Costs. Any cost or credit arising from a change in the quantity of the Contractor's on-Site management (including supervision and administrative personnel) not subject to prevailing wage under ORC Chapter 4115 shall be calculated on an hourly basis according to the rates acceptable to the Contracting Authority.

.1 In no event will the Contractor be entitled to an increase in the Contract Sum on account of Contractor Personnel Costs unless the Contractor actually incurs additional Contractor Personnel Costs solely on account of the associated change in the Work.

.2 Under no conditions will the increase under this **Section 7.8.2.1** exceed those additional Contractor Personnel Costs the Contractor actually incurs.

7.8.2.2 Labor. Any cost or credit arising from a change in the quantity of field labor directly involved in the Work shall be based upon the actual rate of pay to the worker. If the Project is subject to payment of prevailing wage rates, field labor shall be paid according to the relevant classification of labor as established in the applicable prevailing wage determination for the Project locality, as determined by the Ohio Department of Commerce, Wage and Hour Bureau.

.1 In no event will the Contractor be entitled to an increase in the Contract Sum on account of labor costs unless the Contractor actually incurs additional labor costs solely on account of the associated change in the Work.

.2 Under no conditions will the increase under this **Section 7.8.2.2** exceed those additional labor costs the Contractor actually incurs.

.3 The cost for supervision above the level of working forepersons (such as general forepersons, superintendent, project manager, etc.) is included in the adjustment under **Section 7.8.2.1** for the Contractor and under **Section 7.8.2.10** for Subcontractors.

7.8.2.3 Fringes. Fringe benefit credit for labor provided under **Section 7.8.2.2** is only allowable for prevailing wage fringe benefits pursuant to ORC Chapter 4115, including, but not limited to, Health and Welfare, vacation, apprenticeship training, and certain types of pension plans. The parties shall defer to the Ohio Department of Commerce's policy on which benefits are granted fringe benefit credit. Each fringe benefit for which credit is requested shall be calculated on an hourly basis and listed as a separate line item. The Contractor shall submit documentation supporting the calculation of the amounts for each fringe benefit for each worker classification, including labor provided by Subcontractors.

7.8.2.4 Allowable Payroll Expenses. Allowable payroll expenses for labor provided under **Section 7.8.2.2** including payroll taxes as well as other benefits that are required by Applicable Law, such as federal and state unemployment and workers' compensation shall each be a separate line item and shall not be credited for compliance with ORC Chapter 4115.

7.8.2.5 Equipment Rentals. Any cost or credit arising from a change in the quantity of non-owned heavy or specialized equipment shall be based on the documented rental cost, but shall not exceed 100 percent of that documented cost. No rental charges shall be allowed for hand tools, minor equipment, simple scaffolds, etc. Downtime due to repairs, maintenance, and weather delays shall not be allowed. The Contractor shall submit copies of actual paid invoices to substantiate rental costs.

7.8.2.6 Owned Equipment. Any cost or credit arising from a change in the quantity of heavy or specialized equipment owned by the Contractor or Subcontractor performing the Work shall be based on the cost listed by the current edition of the Associated Equipment Distributors' *AED Blue Book* heavy equipment rental rates, but shall not exceed 100 percent of that documented cost. No recovery shall be allowed for hand tools, minor equipment, simple scaffolds, etc. The longest period of time that the equipment is to be required for the Work shall be the basis for the pricing. Downtime due to repairs, maintenance, and weather delays shall not be allowed.

7.8.2.7 Trucking. Any cost or credit arising from a change in the quantity of trucking shall be based on a reasonable delivery charge or per-mile trucking charge for delivery of required materials or equipment. Charges for use of a pick-up truck shall not be allowed.

7.8.2.8 Materials. Any cost or credit arising from a change in the quantity of materials incorporated into the changed Work shall be based on the actual cost (including all discounts, rebates, or related credits) of those materials. Documentation shall show costs, quantities, or Unit Prices of all items, as appropriate.

.1 The cost or credit for reusable materials (e.g., concrete form lumber, shoring, or temporary enclosures) shall be limited to 33 percent of the material cost for each use.

7.8.2.9 Contractor's General Conditions Costs. Any cost or credit arising from a change in the quantity of the Contractor's General Conditions Costs shall be limited to the extent to which the change is attributable to an associated change in the Contract Time for achievement of Substantial Completion resulting from the change in the Work.

.1 In no event shall the Contract Sum adjustment per day of Contract Time adjustment exceed an amount equal to **(1)** the sum of the General Conditions Costs line items in the Contractor's Schedule of Values approved by the Contracting Authority, **(2)** divided by the total number of days of the original Contract Time for achievement of Substantial Completion.

.2 The Contractor shall **(1)** exclude the Bond premium from the Schedule of Values for the purposes of the calculation under **Section 7.8.2.9.1**, and **(2)** include the actual adjustment of the Bond premium attributable to an associated change in the Contract Sum.

.3 If the Contractor purchases the builder's risk insurance for the Project, the Contractor shall **(1)** exclude the builder's risk insurance premium from the Schedule of Values for the purposes of the calculation under **Section 7.8.2.9.1**, and **(2)** include the actual adjustment of the builder's risk insurance premium attributable to an associated change in the Contract Sum.

7.8.2.10 Subcontractor Overhead and Profit. Any cost or credit arising from a change in Subcontractor-performed Work shall include the Subcontractor's aggregate overhead and profit allowance equal to 15 percent of the sum of the Subcontractor's costs described under **Sections 7.8.2.2** through **7.8.2.8** that are associated with that changed Work.

.1 The allowance applies to each Subcontractor tier. The Contractor is not entitled to recover overhead and profit under **Section 7.8.2.10** on account of changes in Contractor self-performed Work or Work the Contractor performs as a Subcontractor at any tier.

Example: Assume that **(1)** the Contractor is self-performing general trades Work and **(2)** the change in the Work includes both $25,000 of electrical trade Work and $10,000 of general trades Work. Under this **Section 7.8.2.10**, **(1)** the Contractor's Subcontractor would be entitled to overhead and profit mark-up but **(2)** the Contractor would not be entitled to any mark-up. Under **Section 7.8.2.11**, the Contractor would be entitled to Contractor's Fee mark-up on its self-performed Work and on the electrical Work. The amount of the Change Order would be calculated as follows: Subcontractor Change Order = $25,000 + ($25,000 x 15%) = $28,750; Contractor Change Order = $10,000 + $28,750 + (($10,000 + $28,750) x 10%) = $42,625.

.2 The allowance covers Subcontractor general conditions costs, home office overhead, and profit including, but not limited to: payroll costs, the costs required to schedule and coordinate the Work, telephone, telephone charges, facsimile, telegrams, postage, photos, photocopying, hand tools, simple scaffolds (one level high), tool breakage, tool repairs, tool replacement, tool blades, tool bits, home office estimating and expediting, home office clerical and accounting support, home office labor (management, supervision, engineering), all costs related to Subcontractor-provided insurance, all other home office expense, legal services, travel, and parking expenses.

.3 An exception is allowed for shop or engineering labor on items in **Section 7.8.2.10.2**, which shall not be subject to Prevailing Wage rates for steel fabricators, sheet metal fabricators, and sprinkler system fabricators performing work off Site. Recovery for these matters shall be allowed on an hourly basis under items in **Sections 7.8.2.2**, **7.8.2.3**, and **7.8.2.4** of these Pricing Criteria.

.4 An exception is allowed for field supervision labor on items in **Section 7.8.2.10.2**, for those portions of the Change Order Work that will be performed, or was performed, at times when the superintendent is not required to be on Site under **Section 6.4**, including but not limited to overtime hours due to acceleration and extensions of the Contract Times. Recovery for this matter will be allowed on an hourly basis under items in **Sections 7.8.2.2**, **7.8.2.3**, and **7.8.2.4** of these Pricing Criteria.

7.8.2.11 Contractor's Fee. Any cost or credit arising from a change in the Work shall include an allowance for the Contractor's Fee equal to **(1)** ten percent times **(2)** the sum of the costs described under **Sections 7.8.2.1** through **7.8.2.10** that are associated with that changed Work.

7.8.2.12 Miscellaneous. Any cost or credit arising from a change in Work may include the following costs with no allowance for Contractor's Fee under **Section 7.8.2.11** or Subcontractor overhead and profit under **Section 7.8.2.10**.

.1 The premium portion only for approved overtime (labor and fringes). The straight time portion is included in items in **Sections 7.8.2.2**, **7.8.2.3**, and **7.8.2.4**.

.2 State sales tax shall be allowed on items as defined by **Section 12.7**.

7.8.3 Costs that shall not be reimbursed for changes in the Work include the following:

7.8.3.1 Voluntary employee deductions including, but not limited to, deductions for charitable donations or U.S. savings bonds.

7.8.3.2 Employee profit sharing.

7.9 Time Extension

7.9.1 Every adjustment of the Contract Times associated with any change in the Work shall be determined as provided in this **Section 7.9**, which establishes the Contractor's maximum entitlement for any change in the Work, including without limitation all adjustments for interference, delay, hindrance, disruption of, or impact on the Work. This **Section 7.9** also governs time adjustments for deduct Change Orders and the Contractor's entitlement to additional time through the Change Directive, Change Request, Claims, and dispute resolution processes on account of changes in the Work.

7.9.2 The Contractor shall substantiate all changes in the Contract Times with:

7.9.2.1 a written description of the nature of the interference, disruption, hindrance, or delay;

7.9.2.2 identification of Persons and events responsible for the interference, disruption, hindrance, or delay;

7.9.2.3 date or anticipated date of commencement of the interference, disruption, hindrance, or delay;

7.9.2.4 identification of activities by schedule activity number and name on the Construction Progress Schedule, which may be affected by the interference, disruption, hindrance, or delay, or new activities created by the interference, disruption, hindrance, or delay and the relationship with existing activities;

7.9.2.5 anticipated duration of the interference, disruption, hindrance, or delay and of any remobilization period;

7.9.2.6 specific number of days of extension requested and specific number of days for remobilization requested;

7.9.2.7 recommended action to avoid or minimize any future interference, disruption, hindrance, or delay; and

7.9.2.8 If the Contracting Authority requests, a Proposal as described under **Section 7.8** for an increase in the Contract Sum which would fully compensate the Contractor for all costs of acceleration of the Work needed to completely overcome the associated delay, if any.

7.9.3 If the Contracting Authority requests, in addition to the requirements under **Section 7.9.2**, the Contractor shall also substantiate changes in the Contract Times with a prospective time-impact analysis (in native format), which illustrates the influence of each change on all affected Milestones and all affected activities. The Contractor shall submit the time-impact analysis within 30 days after the Contracting Authority requests, unless the Contracting Authority and Contractor agree otherwise.

7.9.3.1 The Contractor shall prepare the time-impact analysis consistent with a currently published, recognized standard for construction schedule analysis.

7.9.3.2 The Contractor shall prepare the time-impact analysis on the basis of **(1)** the last Construction Progress Schedule the Contracting Authority approved before the first day of the delay which is the subject of the analysis or **(2)** an interim update of the Construction Progress Schedule if the Contracting Authority determines that the period between the last approved Construction Progress Schedule and first day of the delay which is the subject of the analysis is too long.

7.9.3.3 The time-impact analysis shall include a fragmentary network analysis (fragnet), which **(1)** illustrates the sequence of new activities, activity revisions, or both, that the Contractor proposes to add to the Construction Progress Schedule upon which the time-impact analysis is based and **(2)** mathematically and graphically demonstrates the influence and proper measurement of the delay and how the Contractor proposes to incorporate that delay into the Construction Progress Schedule.

7.9.3.4 The time-impact analysis shall include a written narrative of the analysis.

7.9.4 Critical Path. Time extensions shall depend upon the extent to which the Work on the critical path of the Construction Progress Schedule is affected, if applicable.

7.9.4.1 A Change Order granting a time extension may provide that the Contract Times shall be extended for only those specific elements so interfered with, disrupted, hindered, or delayed and related remobilization and that remaining Milestone dates shall not be altered and may further provide for adjustment of Liquidated Damages.

7.10 Weather Delays

7.10.1 The parties expect adverse weather to delay the Work to some extent, and have included in the Contract Times a certain number of Work Days lost on account of adverse weather as follows:

Month	Expected Number of Work Days Lost Due to Weather
January	8
February	8
March	7
April	6
May	5
June	5
July	4
August	4

September	5
October	6
November	6
December	6

7.10.2 The Contractor will not be entitled to an extension of the Contract Times on account of adverse weather unless the actual number of Work Days lost due to adverse weather in a particular calendar month exceed the expected number of Work Days lost in that calendar month due to adverse weather. The Contractor shall reconcile lost Work Days with the A/E on a weekly basis.

7.10.3 A Work Day will be "lost" if adverse weather reduces the Contractor's efficiency on the Work on the critical path that Work Day to less than 50%. The Contractor shall substantiate its claim that its efficiency on the Work on the critical path that Work Day was less than 50%.

7.10.4 If the Contractor reasonably believes that it is entitled to an extension of the Contract Times on account of Work Days lost due to adverse weather in a particular month, the Contractor shall initiate a Change Request **(1)** as required under **Section 7.6,** and **(2)** within the time period required under **Section 7.6** which begins to run on the last calendar day of that month.

7.11 Examination and Audit of Contractor's Records

7.11.1 The Contracting Authority and Owner may examine all books, records, documents and other data of the Contractor and its Subcontractors related to the bidding, pricing, or performance of the Work for the purpose of evaluating any Contractor Payment Request, Proposal, Modification, or Claim.

7.11.2 The above referenced materials shall be made available at the office of the Contractor or Subcontractor, as applicable, at all reasonable times for inspection, audit, and reproduction until the expiration of ten years after the date of Substantial Completion of all Work.

7.11.2.1 The Contractor shall maintain and require its Subcontractors to maintain complete and accurate business records at its principal place of business. If the principal place of business is greater than 50 miles from the Site, the Contractor shall timely make records available, and shall require its Subcontractors to timely make records available, at the office of the Contracting Authority or Owner upon request for the records.

7.11.3 To the extent that the Contractor or Subcontractor, as applicable, informs the Contracting Authority or Owner in writing that any documents provided to the Contracting Authority or Owner are trade secrets, the Contracting Authority or Owner shall treat those documents, to the extent permitted by Applicable Law, as trade secrets of the Contractor or Subcontractor, as applicable.

7.11.3.1 If a dispute arises with any other Person about whether that Person should be given access to the documents, the Contractor or Subcontractor as applicable, shall indemnify the Contracting Authority and Owner against all costs, expenses, and damages, including but not limited to attorneys' fees, incurred or paid by reason of that dispute.

7.11.4 The right of inspection, audit, and reproduction extends to all documents necessary to permit adequate evaluation of the cost of pricing data submitted along with the computations and projections used therein.

7.11.5 If the Contract has been terminated in whole or in part, the records relating to the Work terminated shall be made available to the Contracting Authority or Owner for a period of ten years from the date of any applicable final settlement or payment, as applicable.

7.11.6 Records that relate to disputes, litigation, or settlement of Claims arising out of the performance of the Work shall be made available until the dispute, litigation or Claims have been finally decided or settled.

ARTICLE 8 - DISPUTE RESOLUTION

8.1 Initiation of a Claim

8.1.1 Every Claim shall accrue upon the date of occurrence of the event giving rise to the Claim.

8.1.2 The Contractor shall initiate every Claim by giving written notice of the Claim to the A/E and Contracting Authority within ten days after occurrence of the event giving rise to the Claim, including:

8.1.2.1 with regard to a Change Directive, the ten-day time limit on initiating a Claim begins to run on the earlier of the date that **(1)** the Contracting Authority issues its determination under **Sections 7.3.8** or **7.3.12; (2)** the A/E issues

a Change Order to the Contractor under **Sections 7.3.8** or **7.3.12**; **(3)** the Contracting Authority rejects the Contractor's Proposal in whole or in part under **Section 7.3.13**; or **(4)** the Contracting Authority is deemed to have rejected the Contractor's Proposal in whole or in part under **Section 7.3.14**; and

8.1.2.2 with regard to a Change Request, the ten-day time limit on initiating a Claim begins to run on the earlier of the date that **(1)** the Contracting Authority issues its determination under **Section 7.6.5**; **(2)** the A/E issues a Change Order to the Contractor under **Section 7.6.5**; **(3)** the Contracting Authority rejects the Contractor's Proposal in whole or in part under **Section 7.6.6**; or **(4)** the Contracting Authority is deemed to have rejected the Change Request in whole or in part under **Section 7.6.7**.

8.1.3 The Contractor's written notice of a Claim shall provide the following information to permit timely and appropriate evaluation of the Claim, determination of responsibility, and opportunity for mitigation:

8.1.3.1 nature and anticipated amount of the impact, including all costs for any interference, disruption, hindrance, or delay, which shall be calculated in accordance with **Section 7.8** and be a fair and reasonably accurate assessment of the damages suffered or anticipated by the Contractor;

8.1.3.2 identification of the circumstances responsible for causing the impact, including, but not limited to, the date or anticipated date, of the commencement of any interference, disruption, hindrance, or delay;

8.1.3.3 identification of activities on the Construction Progress Schedule that will be affected by the impact or new activities that may be created and the relationship with existing activities;

8.1.3.4 anticipated impacts and anticipated duration of any interference, disruption, hindrance, delay, or impact, and any remobilization period;

8.1.3.5 the Contractor's completed and planned actions to mitigate damages by avoiding interference, disruption, hindrance, delay, or impact; and

8.1.3.6 recommended action to avoid or minimize any interference, disruption, hindrance, delay, or impact.

8.1.4 The Contractor's failure to initiate a Claim as and when required under this **Section 8.1** will constitute the Contractor's irrevocable waiver of the Claim.

8.2 Substantiation of Claims – General Requirements

8.2.1 Within 30 days after the initiation of a Claim, the Contractor shall submit three copies of all information and statements required to substantiate a Claim as provided in this **Article 8** and all other information that the Contractor believes substantiates the Claim. The Contractor shall file the three copies by delivering one copy to the A/E, one copy to the Owner, and one copy to the Contracting Authority.

8.2.2 The Contractor shall substantiate all of its Claims by providing the following minimum information:

8.2.2.1 a narrative of the circumstances, which gave rise to the Claim, including without limitation the start date of the event or events and the actual or anticipated finish date;

8.2.2.2 detailed identification of the Work (e.g., activity codes from the Construction Progress Schedule) affected by the event giving rise to the Claim;

8.2.2.3 copies of the Contractor's daily log (**Section 6.2.14**) for each day of impact;

8.2.2.4 copies of relevant correspondence and other information regarding or supporting Contractor entitlement;

8.2.2.5 copies of the Contractor's most-recent income statement and complete and detailed job-cost report, including segregated general and administrative expenses for the most-recent reporting period, and for the period of the Contract, if available, and similar information for any Subcontractor claim included; and

8.2.2.6 the notarized certification described under **Section 8.5.1.1**.

8.2.3 The Contractor's failure to comply with the requirements of this **Section 8.2** will constitute an irrevocable waiver of any related Claim.

8.3 Substantiation of Claims – Increase of the Contract Sum

8.3.1 The Contractor shall substantiate each Claim for an increase of the Contract Sum with:

8.3.1.1 written documentation as described under **Section 7.8** of the actual additional costs to the Contractor due to the event giving rise to the Claim; and

8.3.1.2 the general substantiation documentation described under **Section 8.2**.

8.3.2 The Contractor's failure to comply with the requirements of this **Section 8.3** will constitute an irrevocable waiver of any related Claim.

8.4 Substantiation of Claims – Extension of the Contract Times

8.4.1 The Contractor shall substantiate each Claim for an extension of the Contract Times with:

8.4.1.1 written documentation as described under **Section 7.9** of the actual delay to the critical path of the Construction Progress Schedule due to the event giving rise to the Claim;

8.4.1.2 a Proposal as described under **Section 7.8** for an increase in the Contract Sum that would fully compensate the Contractor for all costs of acceleration of the Work needed to completely overcome the associated delay together with a statement consistent with **Section 8.3.1.1**; and

8.4.1.3 the general substantiating documentation described under **Section 8.2**.

8.4.2 The Contractor's failure to comply with the requirements of this **Section 8.4** will constitute an irrevocable waiver of any related Claim.

8.5 Certification of the Claim

8.5.1 The Contractor shall certify each Claim within 30 days after initiating the Claim under **Section 8.1** by providing the notarized certification specified in **Section 8.5.1.1**, signed and dated by the Contractor:

8.5.1.1 "The undersigned Contractor certifies that the Claim is made in good faith; that the supporting data is accurate and complete to the best of the Contractor's knowledge and belief; that the amount of money, time, or both requested is a fair, reasonable, and necessary adjustment; that the amount of money, time, or both requested is the entire amount of money, time, or both to which the Contractor is entitled on account of the Claim; and that the undersigned is duly authorized to certify the Claim on behalf of the Contractor."

8.5.2 The date that the Contractor's certified and fully substantiated Claim is received by the Contracting Authority, or the date that the Contractor is required to certify and fully substantiate a Claim pursuant to **Sections 8.2.1** and **8.5.1**, shall trigger the 120-day period for exhaustion of administrative remedies pursuant to ORC Section 153.16(B).

8.5.3 The Contractor's failure to comply with the requirements of this **Section 8.5** will constitute an irrevocable waiver of any related Claim.

8.6 Delay and Delay Damage Limitations; Derivative Claims

8.6.1 Subject to other provisions of the Contract, the Contractor will be entitled only to an extension of the Contract Times on account of delay in the commencement or progress of Work on the critical path of the Construction Progress Schedule caused by acts of Nature or the public enemy, acts of the government not arising from the Contractor's failure to comply with Applicable Law, fires, floods, epidemics, weather, and labor disputes beyond the Contractor's control.

8.6.2 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum, or an extension of the Contract Times, or both:

8.6.2.1 on account of the impact of any normal adverse weather on any of the Work or on account of the impact of any abnormal adverse weather as indicated under **Section 7.10** on Work not on the critical path;

8.6.2.2 to the extent that a delay occurs concurrently with a delay attributable to the Contractor; or

8.6.2.3 on account of the delay of any Work not on the critical path.

8.6.3 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum or any type of damages on account of a delay in the commencement or progress of Work on the critical path unless **(1)** the delay is caused by the Owner and **(2)** the delay was not authorized or permitted under the Contract.

8.6.4 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum or any type of damages arising from a delay in the commencement or progress of any of the Work caused by the occurrence or non-occurrence of an event beyond the Owner's control such as acts of Nature or the public enemy, acts of the government, fires, floods, epidemics, labor disputes, unusual delivery delays, weather, or damages caused by the Contractor.

8.6.5 Derivative Claims. Notwithstanding any other provision of the Contract to the contrary, if the Owner prosecutes a claim, suit, or appeal against a Separate Consultant or Separate Contractor to recover damages the Contractor suffers on account of the acts or neglects of a Separate Consultant or Separate Contractor or a person or entity for whom either is

legally responsible, the Owner's liability to the Contractor shall not exceed the amount the Owner actually recovers from the Separate Consultant or Separate Contractor on account of those damages less the costs the Owner incurs recovering them. The Owner is not obligated to prosecute any such claim, suit, or appeal.

8.7 Liquidated Damages

8.7.1 If the Contractor fails to achieve a Milestone within the associated Contract Time, it would be difficult, if not impossible, to determine the Owner's resulting damages. Therefore, if the Contractor fails to achieve a Milestone within the associated Contract Time, the Contractor shall (at the Owner's option) pay to or credit the Owner the Liquidated Damages per day sum determined according to the following schedule for each day that the Contractor fails to achieve a Milestone within the associated Contract Time. If the Project involves more than one Phase as explicitly identified in the Agreement, the Contract Sum in the below schedule refers to the total Contract Sum for each of the Phases individually as opposed to the aggregate Contract Sum for all Phases.

Contract Sum	Liquidated Damages per day for Milestones other than the Punch List Milestone	Liquidated Damages per day for the Punch List Milestone
Less than $1,000,000	$500	$125
From $1,000,000.01 to $2,000,000	$1,000	$250
From $2,000,000.01 to $5,000,000	$2,000	$500
From $5,000,000.01 to $10,000,000	$5,000	$1,250
From $10,000,000.01 to $20,000,000	$7,500	$1,875
From $20,000,000.01 to $50,000,000	$10,000	$2,500
More than $50,000,000	$15,000	$3,750

8.7.2 The Liquidated Damages described in this **Section 8.7** are only intended to compensate the Owner for the damages it incurs as a direct result of the Contractor's failure to achieve the Milestones within their associated Contract Times.

8.7.3 The Liquidated Damages described in this **Section 8.7** are not intended to compensate the Owner for any damages the Owner incurs on account of **(1)** any claims attributable to the Contractor that are brought by others including Separate Consultants and Separate Contractors as a result of the Contractor's failure to achieve the Milestones within their associated Contract Times or **(2)** any failure of the Contractor to timely, properly, and completely perform the Contract other than the failure to achieve the Milestones within their associated Contract Times.

8.7.4 The parties acknowledge that the above-listed Liquidated Damages per day sums are not penalties but are a reasonable estimate of the damages the Owner itself would incur as a direct result of the Contractor's failure to achieve the Milestones within their associated Contract Times. The parties each irrevocably waive the right (if any) to challenge the validity and enforceability of those Liquidated Damages per day sums. Notwithstanding any other provision of the Contract Documents to the contrary, if a court determines that the Liquidated Damages per day sums or their application are void and unenforceable, the Owner shall be entitled to recover the actual damages that it incurs on account of the Contractor's failure to achieve one or more of the Milestones within the Contract Times.

8.7.5 In addition to other rights that the Owner may have relative to the Liquidated Damages, the Contracting Authority may deduct Liquidated Damages from the Contract Sum as the damages accrue. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

8.8 Mutual Waiver of Consequential Damages

8.8.1 Except as provided under **Section 8.8.2**, the Owner and Contractor each waive against the other all Claims for consequential damages that may arise out of or relate to this Contract.

8.8.1.1 The Owner's waiver includes Claims for loss of use, income, profit, revenue, financing, cost of capital, business and reputation, management and employee productivity, and consequential damages arising from termination of the Contract or related to insolvency.

8.8.1.2 The Contractor's waiver includes Claims for unabsorbed home-office overhead; any other form of overhead in excess of that specifically provided for under **Section 7.8**; delay damages except as otherwise specifically provided for in **Section 8.6**; increased cost of funds for the Project; lost opportunity to work on other projects; losses of financing, business, and reputation; loss of profit except anticipated profit arising directly from properly performed Work; loss of bonding capacity; and consequential damages arising from termination of the Contract or related to insolvency.

8.8.2 Notwithstanding **Section 8.8.1**, this **Section 8.8**:

8.8.2.1 does not apply to any damages that would be covered by insurance provided in connection with the Project if the Contract did not include **Section 8.8.1;**

8.8.2.2 does not apply to the Contractor's indemnity obligations for third-party claims against the Indemnified Parties even if those claims are for damages that **Section 8.8.1** would otherwise preclude;

8.8.2.3 does not preclude the Owner's recovery of Liquidated Damages under **Section 8.7**; and

8.8.2.4 does not apply to Claims for damages arising from the Owner's or the Contractor's gross negligence or willful misconduct.

8.8.3 This **Section 8.8** shall survive termination of the Contract.

8.9 Review of the Claim

8.9.1 The A/E shall review the Claim and prepare a written analysis of its content, which shall include:

8.9.1.1 a narrative of the A/E's examination of the facts giving rise to the Claim;

8.9.1.2 identification of relevant Contract Documents and language;

8.9.1.3 an analysis of whether the Contractor complied with the requirements of the Contract Documents pertaining to Claim initiation and substantiation including, without limitation, the issues of entitlement to, and calculation of, adjustments of the Contract Sum, Contract Times, or both;

8.9.1.4 an analysis of claimed additional labor, materials, and equipment for the scope of the Work items described;

8.9.1.5 an analysis of any time extension for any interference, disruption, hindrance, impact, or delay claimed (to include the calculation of any concurrent delays affecting entitlement);

8.9.1.6 a concluding opinion regarding Contractor entitlement to, and the appropriateness and reasonableness of all, or any part of, the Claim; and

8.9.1.7 an appendix containing copies of contemporaneous documentation supporting the concluding opinion.

8.9.2 The A/E shall submit the written analysis to the Project Manager no more than 30 days after receiving the Contractor's substantiated and certified Claim.

8.10 Claim Decision

8.10.1 The Project Manager shall examine the Contractor's Claim and A/E's analysis.

8.10.2 The Project Manager shall approve or deny all, or any part, of the Contractor's Claim and forward a written decision to the Contractor, A/E, Owner, and Contracting Authority within 14 days after receiving the A/E's analysis. The Project Manager may employ independent resources to assist in its review, or refer evaluation of the Claim to a consultant.

8.10.3 If the Contractor and Owner agree with the Project Manager's decision, the decision shall be incorporated into a Change Order.

8.10.4 Any Claim remaining unresolved after completion of the process described under this **Section 8.10** shall be subject to Claim decision review as described under **Section 8.11**.

8.11 Claim Decision Review

8.11.1 The Contractor may request review of the Project Manager's decision by written notice delivered by certified mail within 14 days after the Project Manager's decision.

8.11.1.1 If the Project is administered by the Commission, jointly administered by the Commission and a public school district, or locally administered by authority granted to an agency of the state of Ohio by the Commission, the written notice shall be delivered to the Executive Director of the Commission.

8.11.1.2 If the Project is locally administered by an Institution of Higher Education under ORC Section 3345.50 or ORC Section 3345.51, the written notice shall be delivered to the Institutional Designee who will review the Project Manager's decision instead of the Commission.

8.11.2 The Commission or Institutional Designee, as applicable, shall schedule and conduct a meeting within 30 days after receiving the Contractor's request for review. The Commission or Institutional Designee may employ independent resources to assist in the meeting and review.

8.11.3 The Commission or Institutional Designee, as applicable, shall determine the final disposition of the Contractor's request for review and provide a written decision to the Contractor and Owner within 14 days after the meeting.

8.11.4 The decision of the Commission or Institutional Designee is the final administrative decision of the Contracting Authority as described under ORC Section 153.12(B).

8.11.5 If the Contractor and Owner agree with the Commission's or the Institutional Designee's decision, the decision shall be incorporated into a Change Order.

8.11.6 Any Claim remaining unresolved after completion of the process described under this **Section 8.11** shall be subject to litigation, which may be preceded by Alternative Dispute Resolution ("ADR") as described under **Section 8.13**.

8.12 Delegation

8.12.1 No provision of this **Article 8** shall prevent the Executive Director from delegating the duties or authorities of the Commission to any other person selected at the Executive Director's sole discretion.

8.13 Alternative Dispute Resolution

8.13.1 At any point in the Claims and dispute-resolution processes, the Project's key stakeholders may agree to enter into non-binding ADR including progressive negotiation, dispute review board, mediation, or another non-binding ADR procedure accepted by all of the Project's key stakeholders.

8.14 Audit of the Claim

8.14.1 All Claims shall be subject to audit at any time following filing of the Claim, whether or not the Claim is part of a lawsuit.

8.14.2 The audit may be performed by employees of the Contracting Authority or by a consultant engaged by the Contracting Authority.

8.14.3 The audit may begin upon ten-days' notice to the Contractor or affected Subcontractor.

8.14.4 The Contractor shall cooperate with the request.

8.14.5 Failure of the Contractor or Subcontractor to produce sufficient records to allow the Contracting Authority to audit and verify a Claim will constitute an irrevocable waiver of the Claim or portion of the Claim that could not be completely audited.

8.14.6 The Contractor shall make available to the Contracting Authority all Contractor and Subcontractor documents related to the Claim including, without limitation, the following documents:

8.14.6.1 daily time sheets and superintendent's daily reports;

8.14.6.2 union agreements, if any, and employer agreements;

8.14.6.3 insurance, welfare, fringes, and benefits records;

8.14.6.4 payroll register;

8.14.6.5 earnings records;

8.14.6.6 payroll tax returns;

8.14.6.7 material invoices, purchase orders, Subcontracts, and all material and supply acquisition contracts;

8.14.6.8 material cost distribution worksheets;

8.14.6.9 equipment records (list of Contractor equipment, rates, etc.);

8.14.6.10 vendor rental agreements and Subcontractor invoices;

8.14.6.11 Subcontractor payment certificates;

8.14.6.12 canceled checks (payroll and vendors);

8.14.6.13 complete and detailed job-cost report;

8.14.6.14 job payroll ledger;

8.14.6.15 general ledger, general journal (if used), and all subsidiary ledgers and journals together with all supporting documentation pertinent to entries made in those ledgers and journals;

8.14.6.16 cash disbursements journal;

8.14.6.17 financial statements for all years reflecting operations on the Project;

8.14.6.18 income tax returns for all years reflecting operations on the Project;

8.14.6.19 depreciation records on all equipment utilized whether the records are maintained by the Contractor, its accountant, or others;

8.14.6.20 if a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all other source documents;

8.14.6.21 all documents that reflect the Contractor's actual profit and overhead during the years the Project was being performed;

8.14.6.22 all documents related to the preparation of the Contractor's Bid(s), including the final calculations on which the Bid was based, unless the documents are placed in escrow under provisions of the Instructions to Bidders;

8.14.6.23 all documents that relate to the Claim together with all documents that support the amount of damages as to the Claim;

8.14.6.24 worksheets used to prepare the Claim establishing the cost components for items of the Claim including, but not limited to, labor, fringes, benefits and insurance, materials, equipment, Subcontractors, and all documents that establish the periods of time, individuals involved, the hours and rate of pay for the individuals; and

8.14.6.25 all other documents required by the Contracting Authority to reasonably review the Claim.

8.15 False Certification of the Claim

8.15.1 If the Contractor falsely certifies all or any part of a Claim, the portion of the Claim falsely certified shall be denied, and may be sufficient cause for the State to debar the Contractor from future State contracting opportunities as permitted by Applicable Law.

8.16 Performance and Payment

8.16.1 The Contractor shall proceed with the Work during any dispute resolution process, unless otherwise agreed by the Contractor and Contracting Authority in writing.

8.16.2 The Contracting Authority shall continue to make payment of any undisputed amounts in accordance with the Contract Documents pending final resolution of a Claim, unless otherwise agreed by the Contractor and Contracting Authority in writing.

ARTICLE 9 - COMPENSATION AND PAYMENT

9.1 Allowances

9.1.1 The Contract Sum includes the Allowances (if any) identified in the Contract.

9.1.2 Unless otherwise explicitly stated in the Agreement, Allowance amounts cover all compensation to which the Contractor would be entitled for completing the associated Work, including without limitation the cost to the Contractor (less any applicable trade discounts) of materials and equipment required by the Allowances delivered, unloaded, handled, and installed at the Site; all associated labor costs of every kind; all applicable taxes; and the Contractor's Fee.

9.1.3 Before final payment, an appropriate Change Order will be issued to reconcile the Contract Sum so that it reflects actual amounts due to the Contractor on account of Work covered by Allowances.

9.2 Unit Prices

9.2.1 Unless otherwise explicitly stated in the Agreement:

9.2.1.1 The Contract Sum includes the Unit Price Work (if any) identified in the Agreement.

9.2.1.2 Where the Contract provides that all or part of the Work is to be Unit Price Work, initially the Contract Sum will include for all Unit Price Work **(1)** an amount equal to the sum of the established Unit Prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract plus **(2)** the Contractor's Fee, which is included in the Unit Prices.

9.2.1.3 The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Sum. The Contracting Authority will determine the actual quantities and classifications of Unit Price Work performed by Contractor.

9.2.2 Before final payment, an appropriate Change Order will be issued as described under **Section 7.1.5** to reconcile the Contract Sum so that it reflects actual amounts due to the Contractor on account of Unit Price Work actually performed including an associated adjustment on account of the Contractor's Fee.

9.3 Schedule of Values

9.3.1 Within ten days after receipt of the Notice to Proceed, or other period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the A/E a Schedule of Values on a form published by the Commission, with separate amounts shown for labor and materials for each branch of Work, following the numbers and titles of the Construction Specifications Institute's *MasterFormat* for individual work results, or *UniFormat* for assemblies in place.

9.3.1.1 The Contractor shall clearly indicate on the Schedule of Values, the amount(s) allocated, including separate items for Contractor's Fee, for each EDGE-certified Business used in the performance of the Work. The amount(s) shall indicate labor and materials, as appropriate, and separate items for Contractor's Fee.

9.3.2 The grand total shown on the Schedule of Values shall equal the total Contract Sum. The Contracting Authority may use the approved Schedule of Values to determine the cost or credit to the Owner resulting from any change in the Work.

9.3.2.1 The first items shall be a breakdown of General Conditions Costs.

9.3.2.2 The amounts for labor and materials shall accurately reflect the cost for each item and include Contractor's Fee. Separate line items shall not be shown for Contractor's Fee, except as provided under **Section 9.3.1.1**.

9.3.2.3 If the material allocation exceeds 55 percent of the Contract Sum, the Contractor shall provide, upon request, sufficient information to support the higher percentage.

9.3.2.4 Subcontract Work shall show amounts for labor and materials. Fringe benefits shall be shown as a part of labor costs.

9.3.2.5 When more than one major structure is included in the Work, the Contractor shall subdivide the Schedule of Values accordingly, with cost details for each structure shown separately.

9.3.2.6 The line items shall be coordinated with line items in the Project Schedule, which may require division of items of Work by area of the Project by floor, phase, or other appropriate area.

9.3.2.7 Mechanical and electrical Work shall be included in separate line items for all major pieces of equipment, and group smaller equipment items by type.

9.3.2.8 Line items shall be included for each Allowance, Coordination Drawings, Punch List Work, Project Record Document Submittals, delivery of attic stock, and specified demonstrations and training.

9.3.3 The A/E may return the Schedule of Values to the Contractor for re-submittal if it does not meet the requirements or contains insufficient items or details of the Work, or approve the Schedule of Values if the A/E determines that it conforms to this **Section 9.3**.

9.3.4 No payment shall be made until the A/E has approved the Contractor's Schedule of Values.

9.4 Contractor Payment Request

9.4.1 After the Date of Commencement, the Contractor may request payment of the Contract Sum. The Owner will pay the Contract Sum to the Contractor on a percent-complete progress basis.

9.4.2 The Contractor may submit a Contractor Payment Request to the A/E each month or upon another interval approved by the Contracting Authority. When the rate of Work and amount involved is sufficient that it is considered appropriate by the Contracting Authority, the Contractor may submit Contractor Payment Requests twice a month. The Contractor shall base each Contractor Payment Request on the Schedule of Values current as of the date that the Contractor submits the Contractor Payment Request.

9.4.2.1 The Contractor shall support each Contractor Payment Request with documentation substantiating the Contractor's right to payment. The Contractor shall supply additional documentation as the A/E may request in connection with each payment to the Contractor.

9.4.2.2 The Contracting Authority may require proof of the renewal of required insurance as a condition precedent to payment.

9.4.2.3 The Contractor shall attach certified payroll reports for the relevant period to one copy of each Contractor Payment Request, see **Document 00 73 43 - Prevailing Wage Requirements**.

9.4.2.4 The Contractor may list on the Contractor Payment Request any Change Orders approved and performed prior to submission of the Contractor Payment Request.

9.4.2.5 The Contractor shall submit its Contractor Payment Request using the Contractor Payment Request form or forms current at the time of each application and as provided by the Contracting Authority in the manner prescribed by the Contracting Authority.

9.4.2.6 The Contractor shall submit one draft copy of its Contractor Payment Request ("Pencil Copy") to the A/E not less than one week prior to submitting multiple copies of its Contractor Payment Request. The A/E shall review the Pencil Copy and provide comments to the Contractor within three days after receiving it. The Contractor shall incorporate the A/E's comments into its Contractor Payment Request prior to submitting multiple copies for payment.

9.4.2.7 The Contractor shall clearly indicate on the Contractor Payment Request, the amount(s) requested for each EDGE-certified Business used in the performance of the Contract. The amount(s) shall indicate labor and materials, as appropriate.

9.4.2.8 The Contractor shall submit an electronic copy of the Contractor Payment Request to the A/E with its paper copies of the Contractor Payment Request for collection and reporting of information used for contract compliance evaluation and statistical purposes. The Contractor may issue the copy in any electronic media acceptable to the Contracting Authority.

9.4.3 Payments for Unit Price Work shall be made to the Contractor only for the authorized actual quantities of Work performed or materials furnished in accordance with the Contract Documents.

9.4.4 Subject to **Section 9.8**, the Owner shall pay an approved Contractor Payment Request within 30 days after the date the A/E recommends acceptance of the Contractor Payment Request.

9.5 Retainage on Labor Payments

9.5.1 Partial payments to the Contractor for labor shall be made at the rate of 96 percent of the amount invoiced through the Contractor Payment Request.

9.5.2 If the Project involves more than one Phase as explicitly identified in the Agreement, this **Section 9.5** will apply on a per-Phase basis.

9.6 Release of Retainage on Labor Payments

9.6.1 When the Contractor has achieved Substantial Completion of all Work, and there is no other reason to retain funds, the retained funds shall be paid to the Contractor within 30 days after the Contractor's request, except to the extent necessary, in the Contracting Authority's sole discretion, to assure the Contractor's faithful completion of the Work including but not limited to compliance with **Section 6.26.2**.

9.6.2 Upon consent of the Contractor's Surety, the Contracting Authority may reduce the amount of funds retained for the faithful performance of Work by up to 50 percent of the amount of funds required to be retained, provided the Contractor's Surety remains responsible for all damages that may be caused due to default by the Contractor, including, but not limited to, the following:

9.6.2.1 completion of the Work;

9.6.2.2 all interference, disruption, hindrance, and delay claims;

9.6.2.3 all Liquidated Damages; and

9.6.2.4 all additional expenses incurred by the State.

9.6.3 Funds retained until Contract Completion will be paid to the Contractor as described under **Section 6.31.2.**

9.6.4 If the funds retained under **Section 9.5** accrued interest while withheld from the Contractor, the payments of those retained funds to the Contractor will include that accrued interest.

9.6.5 If the Project involves more than one Phase as explicitly identified in the Agreement, this **Section 9.6** will apply on a per-Phase basis.

9.7 Retainage on Material Payments

9.7.1 The Owner shall pay the Contractor at the rate of 100 percent of the scheduled value for materials incorporated into the Project.

9.7.2 The Owner shall pay the Contractor at the rate of 92 percent of the invoice cost, not to exceed the scheduled value , for materials delivered to the Site, or other off-site storage location approved by the A/E, provided the Contractor provides the following information with the Contractor Payment Request:

9.7.2.1 a list of the fabricated materials consigned to the Project, giving the place of storage, together with copies of invoices verifying quantity and cost, written evidence of insurance covering the off-site stored materials; and

9.7.2.2 a certification of materials stored off-site, prepared by the Contractor and signed by the A/E to evidence that the materials are in conformity with the Specifications and have been tagged with the Project name and number for delivery to the Project. The Contractor shall directly reimburse the A/E for all costs incurred to visit a storage site, other than the areas adjacent to the Project.

9.7.3 The Owner shall pay the balance of the scheduled value when the materials are incorporated into and become a part of the Project.

9.7.4 When payment is allowed for materials delivered to the Site or other approved off-site storage location but not yet incorporated into the Project, the materials are the property of the Owner.

9.7.4.1 The Owner may, at its sole discretion, retain any material not ultimately incorporated into the Project or return it to the Contractor for credit of an amount proportionate to the value of the extra materials.

9.8 Payments Withheld

9.8.1 The A/E may recommend to the Contracting Authority that payments be withheld from, or Liquidated Damages be assessed against, a Contractor Payment Request.

9.8.2 The Contracting Authority may reject any Contractor Payment Request or part thereof, or withdraw any previous Contractor Payment Request, in whole or in part, to the extent necessary in the Contracting Authority's sole opinion to protect the Owner from loss because of:

9.8.2.1 Defective Work not remedied;

9.8.2.2 damage caused by the Contractor;

9.8.2.3 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

9.8.2.4 reasonable evidence that the Work will not be completed within the Contract Times, and that the unpaid balance would not be adequate to cover damages under the Contract Documents for the anticipated delay;

9.8.2.5 failure to comply with Applicable Law including, but not limited to, the requirements of ORC Chapter 4115;

9.8.2.6 failure to timely submit EDGE Participation Reports in accordance with **Section 1.8.2**;

9.8.2.7 failure to timely identify the Contractor's proposed Subcontractors in accordance with **Section 4.1.1**;

9.8.2.8 failure to timely fulfill the Contractor's obligations related to the Construction Progress Schedule;

9.8.2.9 failure to carry out the Work in accordance with the Contract Documents; or

9.8.2.10 that which is permitted under other provisions of the Contract Documents.

9.8.3 The Contracting Authority shall notify the Owner, Contractor, and A/E in writing of the Contracting Authority's exercise of its rights under **Section 9.8.2**. If the Contractor remedies the basis for withholding payment under **Section 9.8.2** to the Contracting Authority's satisfaction, the Owner shall pay the amounts withheld.

9.8.4 If the Contractor takes exception to the withholding of payments under **Section 9.8.2**, the Contractor shall initiate a Claim as and when required under **Article 8**.

9.9 Final Contractor Payment Request

9.9.1 The Contractor, as a condition precedent to Contract Completion and final payment, shall complete all requirements of the Contract Documents.

9.9.1.1 The Contractor and each of its Subcontractors, regardless of tier, shall execute a Payment Release Affidavit to certify that the Contractor and each of its Subcontractors, regardless of tier, have complied with all requirements of ORC Chapter 4115, and to certify that all of its Subcontractors have been paid in full for all Work performed or materials furnished for the Project.

9.9.2 The Owner shall pay the final Contractor Payment Request within 30 days after the date the A/E recommends acceptance of the final Contractor Payment Request.

9.9.3 Acceptance of final payment by the Contractor or a Subcontractor constitutes the payee's waiver of all claims against the State except those previously made in writing under **Article 8** and identified by that payee as unsettled at the time of the final Contractor Payment Request.

ARTICLE 10 - BONDS, INSURANCE, AND INDEMNIFICATION

10.1 Payment and Performance Bonds

10.1.1 Before signing the Agreement, the Contractor shall provide the Bond required under Applicable Law and below:

10.1.1.1 If the Contractor provided **Document 00 43 13 - Bid Security Form** as its Bid Guaranty, then that form shall be the Bond.

10.1.1.2 If the Contractor provided another form of Bid Guaranty, then **Document 00 61 13 - Performance and Payment Bond Form** shall be the Bond.

10.1.1.3 Each Surety under the Bond shall be licensed to do business in Ohio and satisfactory to the Contracting Authority.

10.1.1.4 If there is more than one Surety under the Bond, each of them shall be jointly and severally liable as surety under the Bond.

10.1.1.5 Unless the Contracting Authority and the Owner are the same entity, the Bond shall name as co-obligees **(1)** the State by and through the Contracting Authority and **(2)** the Owner.

- **.1** If any document is used to name the required co-obligees of the Bond (e.g., a form commonly known as a "dual obligee rider"), that document will not alter the terms of the Contract in any way or the terms of the Bond in any way beyond merely naming the co-obligees notwithstanding any term of that document to the contrary.
- **.2** The Surety will not be obligated to more than the Penal Sum of any Bond solely on account of the existence of more than one obligee under that Bond.

10.1.1.6 The penal sum of the Bond, when initially submitted, shall be equal to one-hundred percent of the Contract Sum.

10.1.2 The Contractor shall submit with the executed Bond **(1)** a certified copy of the authority to act (power of attorney) of the agent signing the Bond on behalf of the Surety and **(2)** a current and signed Certificate of Compliance under ORC Section 9.311 issued by the Ohio Department of Insurance showing the Surety is licensed to do business in Ohio.

10.1.3 If the Contract Sum increases at any time such that it exceeds the penal sum of the Bond, the Contractor shall cause the penal sum of the Bond to be increased such that the penal sum equals one-hundred percent of the increased Contract Sum.

10.1.4 Any time the Contractor increases the penal sum of the Bond under **Section 10.1.3**, the Contractor shall deliver to the Contracting Authority an Acknowledgment of Surety from the affected Surety or Sureties to evidence the Surety's or Sureties' receipt of notice of the increased penal sum.

10.1.4.1 The Contracting Authority's receipt of the required Acknowledgement(s) of Surety is a condition precedent to the Owner's obligation to pay the Contractor for any portion of the Work associated with the increase of the penal sum.

10.1.4.2 The Contractor's failure to submit a required Acknowledgment of Surety or a Surety's failure or refusal to provide an Acknowledgment of Surety will not relieve the Surety of its obligation for the increased penal sum.

10.1.4.3 If any Surety fails or refuses to provide a required Acknowledgement of Surety, the Contracting Authority may require the Contractor to deliver to the Contracting Authority a new Bond showing the increased penal sum and written consent of the affected Surety or Sureties confirming the increased penal sum. In that event, the Contracting Authority's receipt of replacement Bonds will be a condition precedent to the Owner's obligation to pay the Contractor for any portion of the Work associated with the increase of the penal sum.

10.1.4.4 Each Acknowledgment of Surety shall be **(1)** on a form provided by the Contracting Authority and **(2)** subject to the acceptance of the Contracting Authority.

10.1.5 If at any time prior to final payment, any surety providing a Bond for the Project **(1)** is adjudged bankrupt or has made a general assignment for the benefit of its creditors; **(2)** has liquidated all assets or has made a general assignment for the benefit of its creditors; **(3)** is placed in receivership; **(4)** otherwise petitions a state or federal court for protection from its creditors; or **(5)** allows its license to do business in Ohio to lapse or to be revoked, then the Contractor shall, within 21 days after any such action listed above, provide the Contracting Authority with a new Bond in the form and

amount described in this **Section 10.1**. The Contracting Authority's receipt of a replacement Bond is a condition precedent to the Owner's obligation to pay the Contractor.

10.1.6 If notice of any change affecting the Contract is required by any Surety or by the provision of any Bond, the Contractor shall provide that notice.

10.2 Contractor's General Insurance Requirements

10.2.1 Throughout the performance of the Work or longer as may be described below, the Contractor shall obtain, pay for, and keep in force, the minimum insurance coverage described in this **Article 10**.

10.2.1.1 Each requirement of this **Article 10** applies to Subcontractors just as it applies to the Contractor.

10.2.1.2 If a Subcontractor's usual insurance coverage does not meet the minimum coverage requirements, before entering into an agreement with that Subcontractor, the Contractor shall submit to the Contracting Authority **(1)** a certificate of insurance evidencing the insurance the Subcontractor will carry without additional compensation and **(2)** if the Contracting Authority requests, a written proposal from the Subcontractor to provide coverage that meets the minimum coverage requirements. The Contracting Authority will decide whether to accept the non-conforming insurance coverage or the proposal to provide conforming coverage.

.1 Notwithstanding any other provision of the Contract to the contrary, the Contractor will not be entitled to any increase of the Contract Sum, Contract Times, or both on account of the Contracting Authority's refusal to accept a Subcontractor's nonconforming insurance coverage.

10.2.1.3 On a case-by-case basis, the Contracting Authority and Contractor may agree to adjust the below requirements for any particular Subcontractor.

10.2.2 Before starting the Work on the Site, upon renewal of any policy, and upon a change of any insurance carrier, the Contractor shall deliver to the Contracting Authority certificates evidencing that the required insurance is in force.

10.2.2.1 Certificates of insurance for other than government-controlled workers' compensation insurance shall identify **(1)** all below-required additional insureds and **(2)** the Project name.

10.2.3 With the exception of government-controlled workers' compensation coverage:

10.2.3.1 the Contractor shall place the insurance with companies that **(1)** are satisfactory to the Contracting Authority, **(2)** hold an A.M. Best Rating of A-, X, or higher, and **(3)** are authorized to conduct business in Ohio;

10.2.3.2 the policies shall be endorsed to require the Contractor's insurance carrier to **(1)** provide 30-days' written notice to the Contracting Authority (as certificate holder) of the cancellation or non-renewal of the insurance and **(2)** provide at least ten-days' written notice to the Contracting Authority (as certificate holder) of the cancellation of the insurance for non-payment of premium; and

10.2.3.3 within 30 days after the Contracting Authority's request, the Contractor shall submit insurance-company certified copies of the policies, the policy endorsements, loss-run reports, or all three.

10.2.4 The Contractor shall pay all deductibles, or self-insured retentions, or both contained in the Contractor's policies of insurance required or provided in connection with the Project. The Contracting Authority reserves the right to approve or reject all levels of self-insured retention, captive insurance programs, or other alternative risk financing the Contractor may use to comply with any insurance requirement.

10.2.5 The Contractor shall pay a proportionate share of the deductibles, or self-insured retentions, or both contained in any insurance policy the Contracting Authority purchases for the Project. The Contractor's proportionate share will derive from the percentage of the associated claim or loss attributable to the alleged or actual negligence of the Contractor or a Subcontractor.

10.2.6 The Contracting Authority and Owner do not represent that required coverage or limits are adequate to protect the Contractor.

10.2.7 Failure of the Contracting Authority to demand a certificate or other evidence of full compliance with the insurance requirements or failure of the Contracting Authority to identify a deficiency from evidence that is provided shall not be construed as a waiver of the Contractor's obligation to maintain the required insurance.

10.2.8 The Contracting Authority may terminate the Contract for cause on account of the Contractor's failure to maintain required insurance.

10.3 Contractor's Minimum Coverage Requirements

10.3.1 Workers Compensation. The Contractor shall maintain workers' compensation coverage meeting the requirements of Applicable Law including, without limitation, the Jones Act and the Longshore & Harbor Workers Compensation Act if Work involves hazards arising from work on or near navigable waterways, including vessels and docks.

10.3.2 Employers' Liability Coverage. The Contractor shall maintain employers' liability coverage with **(1)** an each-accident limit of not less than $1,000,000, **(2)** a disease each-employee limit of not less than $1,000,000, and **(3)** a disease policy limit of not less than $1,000,000.

10.3.3 Commercial General Liability. The Contractor shall maintain commercial general liability ("CGL") coverage that provides **(1)** an each-occurrence limit of not less than $1,000,000, **(2)** a general-aggregate limit of not less than $2,000,000, and **(3)** a products and completed-operations aggregate limit of not less than $2,000,000.

10.3.3.1 The CGL insurance shall be written on ISO occurrence form CG 00 01 04 13 or a substitute form, providing at least equivalent coverage for liability arising from premises, operations, independent contractors, products/completed-operations, personal and advertising injury, and liability assumed under an insured contract.

10.3.3.2 The Contractor shall include the State, Contracting Authority, Owner, and A/E as additional insureds under the CGL policy using ISO endorsement CG 20 10 07 04 and ISO endorsement CG 20 37 07 04 or a substitute form(s) providing equivalent coverage.

10.3.3.3 The CGL policy shall be endorsed using ISO endorsement CG 25 03 or a substitute form providing equivalent coverage to provide that the general aggregate limit applies separately to each of the insured's projects.

10.3.3.4 The CGL policy shall not exclude coverage for property damage to the Work arising out of the products/completed-operations hazard where a Subcontractor performed the damaged Work or the Work out of which the damage arises.

10.3.3.5 The CGL insurance shall not exclude coverage for property damage to electronic data.

10.3.3.6 The CGL insurance shall apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs that cover the additional insured(s).

10.3.3.7 The CGL policy shall not exclude coverage to the additional insured(s) for bodily injury or property damage arising out of the products/completed-operations hazard.

10.3.3.8 The Contractor shall maintain the CGL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.4 Business Automobile Liability. The Contractor shall maintain business automobile ("BA") coverage written on ISO form CA 00 01 04 13 or a substitute form, providing at least equivalent coverage with a limit of not less than $1,000,000 each accident.

10.3.4.1 The coverage shall extend to any auto (owned, not owned, leased, rented, hired, or borrowed).

10.3.4.2 The Contractor shall include the State, Contracting Authority, Owner, and A/E as additional insureds under the BA policy.

10.3.4.3 The BA policy shall include an MCS-90 endorsement if transporting hazardous wastes/materials.

10.3.5 Umbrella/Excess Liability. The Contractor may employ an umbrella/excess liability policy to achieve the above-required minimum coverage.

10.3.5.1 The Contractor shall maintain umbrella/excess liability coverage with a limit of not less than $2,000,000 (in addition to the above-required limits) if the Work (or the Work to be performed by the Subcontractor) includes any of the following:

.1 brick/block masonry;
.2 exterior caulking/sealant;
.3 cast-in-place or precast concrete;
.4 curtain wall;
.5 dampproofing/waterproofing;
.6 electrical;
.7 elevator;
.8 exterior glass and/or glazing;
.9 exterior marble, granite, and/or other stonework;
.10 miscellaneous metals;

.11 plaster/stucco;
.12 plumbing;
.13 HVAC;
.14 roofing and/or sheet metal;
.15 scaffolding;
.16 spray-on fireproofing;
.17 sprinkler and/or fire protection; or
.18 structural steel and/or metal deck.

10.3.5.2 The Contractor shall maintain umbrella/excess liability coverage with a limit of not less than $5,000,000 (in addition to the above-required limits) if the Work (or the Work to performed by the Subcontractor) includes any of the following:

.1 caissons and/or piles;
.2 demolition;
.3 excavation and/or utility work;
.4 sheeting, shoring, and/or underpinning;
.5 window washing equipment; or
.6 wrecking.

10.3.6 Contractor's Pollution Liability. If the Work includes environmentally sensitive, hazardous types of activities (such as demolition, exterior insulation finish systems, Asbestos abatement, storage-tank removal, or similar activities), or involves Hazardous Materials, the Contractor shall maintain a contractor's pollution liability ("CPL") policy with **(1)** a per-claim limit of not less than $1,000,000 and **(2)** an annual-aggregate limit of not less than $1,000,000, covering the acts, errors and/or omissions of the Contractor for damages (including from mold) sustained by the Owner by reason of the Contractor's performance of the Work.

10.3.6.1 The CPL policy shall have an effective date, which is on or before the date that the Contractor first started to perform any Project-related services.

10.3.6.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the CPL policy's limits.

10.3.6.3 The Contractor shall maintain the CPL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.7 Professional Liability—Contractor. The Contractor shall maintain contractor's professional liability ("PL") insurance (including without limitation for sprinkler and/or fire protection and other design-build work included in the Work, and services related to coordination and scheduling of construction activities, and means and methods) without design-build exclusions with limits not less than as identified in the following table:

Contract Sum	Each Claim	Annual Aggregate
Up to $50,000,000	$1,000,000	$2,000,000
More than $50,000,000	$2,000,000	$4,000,000

10.3.7.1 The PL policy shall have an effective date on or before the date that the Contractor first started to provide any Project-related services.

10.3.7.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the PL policy's limits.

10.3.7.3 The Contractor shall maintain the PL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.7.4 If the Contractor is authorized under Applicable Law to directly provide professional design services, the Contractor may satisfy the requirements of this **Section 10.3.7** by providing a professional liability insurance policy.

10.3.7.5 If the Contractor is a joint venture:

.1 the Contractor may meet the requirements of this **Section 10.3.7** by providing a PL policy under which each joint venturer is the insured; or
.2 each joint venturer shall individually meet the requirements of this **Section 10.3.7** by providing a PL policy **(1)** under which the individual joint venturer is the insured and **(2)** that covers that joint venturer's interests

in the joint venture by endorsement or otherwise. The certificate of insurance shall reflect that the PL policy covers the joint venturer's interest in the joint venture.

Example: Assume that the Contractor **(1)** is the "XY joint venture" of company "X" and company "Y"; and **(2)** is required under **Section 10.3.7** to maintain PL insurance limits of $1M/$2M. In order to comply with **Section 10.3.7.5.2**, "X" must maintain PL insurance limits of $1M/$2M and "Y" must maintain PL insurance limits of $1M/$2M.

10.3.7.6 If the Contractor is a limited-liability company, which members consist of two or more separate firms:

.1 the Contractor may meet the requirements of this **Section 10.3.7** by providing a PL policy under which the limited-liability company is the insured; or

.2 each member of the limited-liability company shall individually meet the requirements of this **Section 10.3.7** by providing a PL policy **(1)** under which the individual member is the insured and **(2)** that covers that member's interests in the limited-liability company by endorsement or otherwise. The certificate of insurance shall reflect that the PL policy covers the member's interest in the limited-liability company.

Example: Assume that the Contractor **(1)** is the "XY limited-liability company," the members of which are "X" and "Y"; and **(2)** is required under **Section 10.3.7** to maintain PL insurance limits of $1M/$2M. In order to comply with **Section 10.3.7.6.2**, "X" must maintain PL insurance limits of $1M/$2M and "Y" must maintain PL insurance limits of $1M/$2M.

10.3.8 Professional Liability—Subcontractors. If the Work to be performed by a Subcontractor includes any professional design services (including without limitation sprinkler and/or fire protection and other design-build work) the Subcontractor shall maintain contractor's PL insurance without design-build exclusions with limits not less than as identified in the following table:

Subcontract Sum	Each Claim	Annual Aggregate
Up to $50,000,000	$1,000,000	$2,000,000
More than $50,000,000	$2,000,000	$4,000,000

10.3.8.1 The PL policy shall have an effective date on or before the date that the Subcontractor first started to provide any Project-related services.

10.3.8.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the Subcontractor's PL policy's limits.

10.3.8.3 The Subcontractor shall maintain the PL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.8.4 If the Subcontractor is authorized under Applicable Law to directly provide professional design services, the Subcontractor may satisfy the requirements of this **Section 10.3.7.5** by providing a professional liability insurance policy.

10.3.9 Aviation Liability. If the Contractor or a Subcontractor uses manned or unmanned aircraft, including helicopters, in performance of the Work, the Contractor shall maintain aircraft or aviation liability coverage in an amount of no less than $10,000,000. The Contracting Authority and Owner will not be liable for any damage to any aircraft owned, leased, rented, or borrowed by the Contractor or a Subcontractor.

10.3.10 Watercraft Liability. If the Contractor or a Subcontractor uses watercraft in performance of the Work, the Contractor shall maintain watercraft liability coverage including protection and indemnity insurance in an amount of no less than $5,000,000. The Contracting Authority and Owner will not be liable for any damage to any watercraft owned, leased, rented, or borrowed by the Contractor or Subcontractor.

10.3.11 Equipment Coverage. The Contracting Authority and Owner will not insure or be liable for damage to any Contractor or Subcontractor owned, leased, rented, or borrowed tools, equipment, or vehicles. The Contractor and Subcontractors are solely responsible for maintaining all insurance necessary to cover their tools, equipment, and vehicles.

10.3.12 Ocean Marine Insurance. If the shipment of equipment or materials for the Work will not be covered by the builder's risk insurance described under **Section 10.4**, the Contractor shall maintain ocean marine insurance to the Site including cost, insurance, and freight with limits of not less than an amount equal to the full replacement cost of equipment/materials shipped to final destination point.

10.3.12.1 The insurance shall include the following minimum requirements:

.1 all-risk basis including war risk and all forms of terrorism;
.2 coverage for general average and salvage charges;
.3 "on deck" coverage;
.4 warehouse-to-warehouse coverage;
.5 coverage to include losses from strikes, riots, and civil commotions ("SR&CC coverage");
.6 coverage to include losses from free of capture and seizure warranty ("FC&S Warranty coverage");
.7 "Inchmaree" clause;
.8 sue and labor;
.9 "both-to-blame" coverage;
.10 free of particular average;
.11 inland coverage including on-land shipment, port storage, and barge transit upon inland waterways; and
.12 damage by saltwater and rainwater perils and cargo sweat.

10.3.13 Additional Property Insurance. For any demolition, blasting, excavating, tunneling, shoring, or similar operations, the Contractor shall provide and maintain Property Damage Liability insurance with a limit of liability equal to the limit as specified in the applicable sections of **Article 10**.

10.4 Builder's Risk Insurance

10.4.1 The Contractor shall maintain a builder's risk insurance policy written on a special causes of loss form and an open-perils basis providing coverage for direct physical loss of or damage to covered property arising from insured perils that shall not exclude: theft; fire; vandalism; malicious mischief; earthquake; earth movement; tornado; lightning; explosion; breakage of glass; flood; windstorm; collapse; water damage; hot and cold testing; debris removal and/or demolition occasioned by enforcement of Applicable Law; sudden and accidental equipment breakdown; and resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials.

10.4.1.1 The policy shall cover the Project in the course of construction including false-work, temporary buildings and structures, and materials used in the construction process, stored on or off-site, or while in transit.

10.4.1.2 The coverage shall be written on a replacement-cost basis in an amount equal to not less than the initial Contract Sum, plus the value of: **(1)** all subsequent GMP Amendments and Modifications; **(2)** materials supplied and installed by others; and **(3)** any furnishings, fixtures, materials, or equipment located at the Site. All sub-limits of coverage are subject to the prior written approval of the Contracting Authority and Owner.

10.4.1.3 The policy shall not include any deductible of more than $25,000 per occurrence. Any deductible over that amount is subject to the prior written approval of the Contracting Authority and Owner.

10.4.1.4 The named insureds under the policy shall include the State, Contracting Authority, Owner, Contractor, Subcontractors at all tiers, and Separate Contractors.

10.4.1.5 Coverage shall include the reasonable extra costs of acceleration and expediting temporary and permanent repairs to, or permanent replacement of, damaged property. Those covered costs shall include overtime wages and the extra cost of "express" or other means for rapidly transporting materials and supplies necessary to the repair or replacement.

10.4.1.6 Coverage shall include a "soft cost endorsement" including, but not limited to, the reasonable extra costs of the A/E and reasonable Contractor extension or acceleration costs.

10.4.1.7 Coverage shall waive all rights between the Owner, Contracting Authority, Contractor, and Subcontractors at any tier, for damages caused by fire or any other perils to the extent of actual recovery of any insurance proceeds under the policy.

10.4.1.8 Coverage shall include provisions for mechanical or electrical breakdown, or boiler system testing if a boiler system is part of the Work.

10.4.1.9 Coverage shall include temporary structures and scaffolding, along with collapse coverage.

10.4.1.10 Coverage shall be primary to all other applicable insurance.

10.4.1.11 The policy shall specifically permit and allow for Partial Occupancy as defined under the Contract Documents and for partial occupancy or a similar term as used under the policy.

10.4.1.12 The Contractor shall maintain the policy in effect until Substantial Completion of all Work. The Contractor shall provide written notice to the Contracting Authority no less than 30 days before the expiration or termination of the policy.

10.4.1.13 The Contractor's tools and equipment shall not be covered under the builder's risk policy. It is the Contractor's sole responsibility to maintain such coverage, the cost of which shall be included in its Overhead (a component of Contractor's Fee) and not included as a separate item in the Contractor's Schedule of Values.

10.4.2 If the Contractor is involved solely in the installation of material and equipment and not in new building construction, the Contractor shall purchase and maintain a builder's risk, builder's risk-renovations, or installation floater insurance policy. The policy shall comply with the provisions of **Section 10.4.1.**

10.4.3 No less than ten days before the Contractor starts to perform any Work on the Site, the Contractor shall provide to the Contracting Authority an insurance-company certified copy of the complete insurance policy required under **Section 10.4.1** or **10.4.2** as applicable. The Contracting Authority's receipt of that copy of the policy is a condition precedent to the Contractor's entitlement to payment of any portion of the Contract Sum.

10.5 Waivers of Subrogation

10.5.1 To the fullest extent permitted by Applicable Law, the Contractor waives all rights against the Owner, Contracting Authority, and their agents and employees for damages to the extent covered by any insurance, except rights to the proceeds of that insurance. All policies shall accomplish the waiver of subrogation by endorsement or otherwise.

10.5.2 The Owner, Contracting Authority, and Contractor waive all rights against each other for damages caused by fire or other perils to the extent of actual recovery of any insurance proceeds under any property insurance, inland marine insurance, or builder's risk insurance applicable to the Work.

10.6 Indemnification for Injury or Damage

10.6.1 To the fullest extent permitted by Applicable Law, the Contractor shall indemnify, defend, and hold harmless the Indemnified Parties from and against all claims, costs, damages, losses, fines, penalties, and expenses (including but not limited to all fees and charges of attorneys and other professionals, and all court, arbitration, or other dispute-resolution costs) arising out of or in connection with the Project, provided that any such claim, cost, damage, loss, fine, penalty, or expense is attributable to:

10.6.1.1 bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property but only to the extent caused by the negligent acts, errors, or omissions of the Contractor or a person or entity for whom the Contractor may be liable;

10.6.1.2 infringement of patent rights or copyrights by the Contractor or a person or entity for whom the Contractor may be liable; or

10.6.1.3 a violation of Applicable Law but only to the extent attributable to the Contractor or a person or entity for whom the Contractor may be liable.

10.6.2 The Contractor's indemnification obligation under **Section 10.6** exists regardless of whether or not and the extent to which the claim, damage, loss, fine, penalty, or expense is caused in part by a party indemnified under **Section 10.6**. But nothing in **Section 10.6** obligates the Contractor to indemnify any individual or entity from and against the consequences of that individual or entity's own negligence.

10.6.3 The Contractor's obligations under **Section 10.6** shall not extend to the liability of the A/E, A/E's consultants, agents, representatives, or employees for negligent preparation or approval of Drawings, Specifications, Change Orders, opinions, and any other responsibility of the A/E, except to the extent covered by the Contractor's insurance.

10.6.4 In claims against an Indemnified Party by any direct or indirect employee (or the survivor or personal representative of that employee) of the Contractor or a person or entity for whom the Contractor may be liable, the indemnification obligation under **Section 10.6** will not be limited by a limitation on the amount or type of damages, compensation, or benefits payable under workers' compensation acts, disability benefit acts, or other employee benefit acts.

10.6.5 The Contractor's indemnification obligation under **Section 10.6** will not be limited by any insurance policy provided or required in connection with the Project.

10.6.6 The Contractor's obligations under **Section 10.6** shall not negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to an Indemnified Party.

10.6.7 The Contractor's indemnification obligation under **Section 10.6** will survive termination of the Contract and Contract Completion.

10.6.8 The Contracting Authority may deduct from the Contract Sum the claims, damages, losses, fines, penalties, and expenses for which the Contractor is liable under **Section 10.6**. If those claims, damages, losses, fines, penalties, and expenses exceed the unpaid balance of the Contract Sum, the Contractor shall immediately pay the difference to the Owner.

ARTICLE 11 - SUSPENSION AND TERMINATION

11.1 Suspension of the Work

11.1.1 The Contracting Authority, without cause and without prejudice to any other right or remedy it may have, may order the Contractor in writing to suspend, delay, or interrupt performance of the Work in whole or in part for such period as the Contracting Authority may determine.

11.1.1.1 If the Contracting Authority suspends the Work under this **Section 11.1.1** and the Contractor complies with **Article 7** and **Article 8**, the Contract Sum and Contract Times shall be adjusted for increases in the cost and time caused by the suspension, delay, or interruption.

11.1.1.2 Notwithstanding the foregoing, no adjustment shall be made to the Contract Sum or Contract Times to the extent that:

.1 performance was or could have been suspended, delayed, or interrupted by a cause for which the Contractor is responsible; or

.2 an equitable adjustment is made or denied under another provision of the Contract.

11.1.1.3 If the Contracting Authority suspends the Work under this **Section 11.1.1** and the Contractor submits a proper Contractor Payment Request, subject to all other provisions of the Contract Documents, the Contractor shall be entitled to payment of compensation due under the Contract Documents for Work performed before the suspension based upon the Schedule of Values.

11.1.2 The Contracting Authority, without prejudice to any other right or remedy it may have, may order the Contractor in writing to suspend, delay, or interrupt the performance of the Work in whole or in part for such period as the Contracting Authority may determine for any of the following reasons: **(1)** Defective Work; **(2)** the Contractor is causing undue risk of damage to any part of the Project or adjacent area; **(3)** the Contractor fails to furnish or perform the Work in such a way that the complete Work will conform to the requirements of the Contract Documents; or **(4)** any other cause the Contracting Authority reasonably believes justifies suspension.

11.1.2.1 The Contracting Authority's exercise of its right to suspend the Work under this **Section 11.1.2** shall not entitle the Contractor to any adjustment of the Contract Sum, Contract Times, or both.

11.1.2.2 If the Contracting Authority is adjudged to have improperly or unjustifiably suspended the Work under this **Section 11.1.2**, the suspension shall be deemed to have been a suspension under **Section 11.1.1**.

11.1.3 Upon receipt of notice of suspension under this **Section 11.1**, the Contractor shall cease Work on the suspended activities and take all necessary or appropriate steps to limit disbursements and minimize respective costs. The Contractor shall furnish a report to the Contracting Authority, within five days after receiving the notice of suspension, describing the status of the Work, including, but not limited to, results accomplished, resulting conclusions, and other information as the Contracting Authority may require.

11.1.4 The Contracting Authority's right to stop the Work shall not give rise to any duty to exercise the right for the benefit of the Contractor or any other party, and the Contracting Authority's exercise or failure to exercise the right shall not prejudice any of the Contracting Authority's other rights.

11.2 Termination for Convenience

11.2.1 The Contracting Authority may at any time terminate the Contract in whole or in part for the Owner's convenience and without cause, upon written notice to the Contractor.

11.2.2 Upon receipt of the notice of termination for convenience, the Contractor shall immediately proceed with performance of the following duties in accordance with instructions from the Contracting Authority:

11.2.2.1 cease operation as specified in the notice;

11.2.2.2 proceed as described under **Section 11.3.4;** ;

11.2.2.3 proceed with Work not terminated; and

11.2.2.4 take actions that may be necessary, or that the Contracting Authority may direct, for the protection and preservation of the terminated Work.

11.2.3 After terminating the Contract for convenience, the Owner shall pay the Contractor in accordance with the Schedule of Values for Work completed, including Contractor's Fee, any retained funds, and the value of materials ordered and delivered, less any salvage credit the Contractor may receive for them.

11.2.3.1 All materials, equipment, facilities, and supplies at the Site or stored off-site, for which the Contractor has received payment, shall become the property of the Owner.

11.2.3.2 In no event shall the Contractor be entitled to **(1)** Contractor's Fee on or any other compensation for Work not performed or **(2)** compensation in excess of the total Contract Sum.

11.2.4 If the Contracting Authority terminates the Work under this **Section 11.2**, the termination shall not affect the rights or remedies of the State against the Contractor then existing or which may thereafter accrue.

11.2.5 Notwithstanding **Section 11.2.3**, if the Contracting Authority terminates the Work under this **Section 11.2**, but there exists an event of the Contractor's default, the Contractor shall be entitled to receive only such amounts as it would be entitled to receive following the occurrence of an event of default as provided in **Section 11.3**.

11.3 Termination for Cause

11.3.1 The Contracting Authority may terminate the Contract in whole or in part if the Contractor commits a material breach of the Contract including but not limited to:

11.3.1.1 failure to prosecute the Work with the necessary force or in a timely manner;

11.3.1.2 refusal to remedy Defective Work;

11.3.1.3 failure to supply enough properly skilled workers or proper materials;

11.3.1.4 failure to properly make payment to Subcontractors or Consultants;

11.3.1.5 performance of any services outside of the United States;

11.3.1.6 permitting its Subcontractors or Consultants to perform any services outside of the United States; or

11.3.1.7 disregarding laws, ordinances, rules, regulations, or orders of a public authority with jurisdiction over the Project.

11.3.2 If the Contracting Authority intends to exercise its termination rights under this **Section 11.3**, the Contracting Authority shall issue not less than five days' written notice to the Contractor and the Contractor's Surety in accordance with ORC Section 153.17 ("Five-Day Notice").

11.3.2.1 Notwithstanding any provision of the Contract to the contrary **(1)** the issuance of a 72-Hour Notice under **Section 6.24.1** is not a condition precedent to the Contracting Authority's exercise of its rights under **Section 11.3** and **(2)** the Contracting Authority's decision to not issue a 72-Hour Notice under **Section 6.24.1** will not prejudice the Contracting Authority's rights under **Section 11.3**.

11.3.3 If the Contractor fails to satisfy the requirements set forth in the Five-Day Notice within 15 days after receipt of the Five-Day Notice, the Contracting Authority may declare the Contractor in default, terminate the Contract, and employ upon the Work the additional force or supply materials or either as appropriate, and remove Defective Work.

11.3.4 After termination, the Contractor shall to the extent related to the performance of the discontinued portion of the Work, unless the notice of termination directs otherwise:

11.3.4.1 immediately discontinue the Work on that date, place no further orders or Subcontracts for materials, equipment, services, facilities, or otherwise, except as may be necessary for completion of such portion of the Work as is not discontinued;

11.3.4.2 subject to the Contracting Authority's exercise of its rights under **Section 4.5**, promptly make every effort to procure cancellation upon terms satisfactory to the Contracting Authority of all Subcontracts;

11.3.4.3 promptly work with the Contracting Authority in good-faith to develop and implement plans to **(1)** secure the Site and off-Site stored materials; **(2)** inventory and verify **(a)** the location and quantity of materials stored on and off-Site and **(b)** the status of the progress of the Work; and **(3)** identify all Project-related permits;

11.3.4.4 no less than five days after the effective date of the termination, deliver to the Contracting Authority all Contractor-maintained, Project-related permits;

11.3.4.5 no less than seven days after the effective date of the termination, deliver to the Contracting Authority the following information and documents concerning each Subcontractor: **(1)** name and address; **(2)** name, address, telephone number, and email address of the Subcontractor's primary point of contact for the Project; **(3)** scope of the Subcontract Work (including equipment supplied); **(4)** a complete and unredacted copy of the Subcontract(s); **(5)**

complete and unredacted copies of all Subcontract modifications (e.g., change orders, amendments, etc.) and related documents; **(6)** complete and unredacted copies of all pending claims, requests for additional compensation, requests for additional time, unexecuted change orders, and related documents; **(7)** complete and unredacted copies of all pay applications (paid and pending); **(8)** a complete and unredacted copy of the Contractor's accounts-payable report for the Subcontractor; **(9)** complete and unredacted copies of any non-conforming Work reports/notices and related documents; and **(10)** complete and unredacted copies of any surety bond(s) or other performance security provided by the Subcontractor.

11.3.4.6 no less than 21 days after the effective date of the termination, pay all undisputed amounts due to each Subcontractor for Work performed before the effective date of termination and deliver to the Contracting Authority lien waivers to evidence those payments; and

11.3.4.7 do only such Work as may be necessary to protect the Work already in progress and to protect materials and equipment on the Project Site or in transit thereto.

11.3.5 If the Contract is terminated, the Contractor's Surety may perform the Contract. If the Contractor's Surety does not commence performance of the Contract within ten days after the date of Contract termination, the Contracting Authority may complete the Work by any means the Contracting Authority determines appropriate. The Contracting Authority may take possession of and use all materials, facilities, and equipment at the Site or stored off-site, for which the Owner has paid.

11.3.6 If the Contract is terminated, the Contractor shall not be entitled to further payment. If the unpaid balance of the Contract Sum is exceeded by the costs of finishing the Work, including without limitation the fees and charges of engineers, architects, attorneys, and other professionals and court costs, and other damages incurred by the Owner and not expressly waived, the Contractor or Surety shall immediately pay the amount of the insufficiency to the Owner. This obligation for payment shall survive termination of the Contract.

11.3.7 If the Contractor's Surety performs the Work, the provisions of the Contract Documents govern the Surety's performance, with the Surety in place of the Contractor in all provisions including, but not limited to, provisions for payment for the Work, and provisions of the right of the Contracting Authority to complete the Work.

11.3.8 If the Contracting Authority terminates the Contract under this **Section 11.3**, the termination shall not affect any rights or remedies of the State against the Contractor then existing or which may thereafter accrue. The Contracting Authority's retention or payment of funds due the Contractor shall not release the Contractor or the Contractor's Surety from liability for performance of the Work in accordance with the requirements of the Contract Documents.

11.3.9 If the Contracting Authority is adjudged to have improperly or unjustifiably terminated the Contract under this **Section 11.3**, the termination will be deemed to have been a termination under **Section 11.2**.

11.4 Contractor Insolvency

11.4.1 The Contracting Authority may immediately terminate the Contract for cause if:

11.4.1.1 the Contractor commences a voluntary case under Title 11 of the United States Code or the corresponding provisions of any successor laws; or

11.4.1.2 any legal entity commences an involuntary case against the Contractor under Title 11 of the United States Code or the corresponding provisions of any successor laws and **(1)** the case is not dismissed within 60 days after its commencement; or **(2)** the court before which the case is pending issues an order for relief or similar order approving the case; or

11.4.1.3 a court of competent jurisdiction appoints, or the Contractor makes an assignment of all or substantially all of its assets to, a receiver, trustee, liquidator, or other similar custodian for the Contractor or all or substantially all of the Contractor's assets; or

11.4.1.4 any attachment, execution, or other judicial seizure is levied against all or substantially all of the Contractor's assets; or

11.4.1.5 the Contractor takes any action toward the dissolution or winding up of its business; or

11.4.1.6 the Contractor fails generally to pay its debts as they become due (unless those debts are subject to a good-faith dispute as to liability or amount) or it acknowledges in writing that it is unable to do so.

11.4.2 If the Contractor files a voluntary petition in bankruptcy or has an involuntary petition in bankruptcy filed against it, the Contractor, the Contractor as the debtor-in-possession, or the trustee of the Contractor's bankruptcy estate shall file a motion to assume or reject the Contract under Bankruptcy Code § 365, 11 U.S.C. § 365, within 20 days after the

filing of the voluntary petition or involuntary petition and shall diligently prosecute that motion to conclusion so as to obtain an order granting or denying that motion within 45 days after the filing of the voluntary or involuntary petition.

11.4.3 If the Contracting Authority intends to exercise its termination rights under this **Section 11.4**, the Contracting Authority shall notify the Contractor in writing of the Contracting Authority's termination of the Contract and the cause(s) for that termination.

11.4.4 The Contractor agrees to the granting of relief from the automatic stay of the Bankruptcy Code, 11 U.S.C. § 362(a), to permit the Contracting Authority to terminate the Contract for cause in such instance and issue and serve all notices necessary to terminate the Contract or arising out of the termination of the Contract and to take any and all other action necessary to terminate the Contract.

ARTICLE 12 - GENERAL PROVISIONS

12.1 Contractor's Documents and Contract Documents

12.1.1 Ownership.

12.1.1.1 The Owner alone owns the Contractor's Documents and the Contract Documents and every right, title, and interest therein.

.1 The Contractor shall execute and deliver and cause its employees and agents and all Subcontractors and Consultants to execute and deliver to the Owner any transfers, assignments, documents, or other instruments (if any) necessary to vest in the Owner complete right, title, interest in and ownership of the Contractor's Documents and the Contract Documents.

12.1.1.2 The Contractor may retain copies, including reproducible copies, of the Contractor's Documents and the Contract Documents for information, reference, and performance of the Work.

12.1.1.3 The submission or distribution of the Contractor's Documents or the Contract Documents to meet official regulatory requirements or for similar purposes in connection with the Project is not a waiver of the Owner's reserved rights in the Contractor's Documents and the Contract Documents. Any unauthorized use of the Contractor's Documents or the Contract Documents shall be at the sole risk of the entity making the unauthorized use.

12.1.1.4 The Contractor shall provide Electronic Files of the Contractor's Documents to Separate Consultants and Separate Contractors for their use in connection with the Project. The Contractor shall provide the Electronic Files **(1)** at no additional cost to the Separate Consultants, Separate Contractors, and Owner and **(2)** without requiring the Separate Consultants, Separate Contractors, or Owner to agree to any terms or conditions concerning the provision, receipt, or use of the Electronic Files that differ in any material respect from the Contract.

12.1.2 Intent.

12.1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor.

12.1.2.2 The Contract Documents are complementary, and what is required by one is binding as if required by all.

12.1.2.3 The Contractor shall provide all labor and materials necessary for the entire completion of the Work described in the Contract Documents and reasonably inferable to produce the intended results.

12.1.2.4 The Drawings govern dimensions, details, and locations of the Work. The Specifications govern quality of materials and workmanship.

12.1.2.5 The organization of the Specifications in divisions, sections, and articles, and the arrangement of Drawings shall not restrict the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

12.1.2.6 In the event of inconsistency or conflict within the Contract Documents, the Contractor shall provide the better quality or greater quantity of Work, and comply with the stricter requirement.

12.1.2.7 Unless otherwise defined in the Contract Documents, words that have well-known technical or construction industry meanings are used in accordance with those recognized meanings.

12.1.2.8 The Sections of Division 01 - "General Requirements" govern the performance of the Work of all Sections of the Specifications.

12.1.3 Use of Electronic Files.

12.1.3.1 The Owner, Contracting Authority, A/E, and Contractor reasonably expect that they will provide Electronic Files to each other to facilitate the design and construction of the Project consistent with current practices and customs in the construction industry.

12.1.3.2 The Owner, Contracting Authority, A/E, and Contractor acknowledge that the use of Electronic Files involves risks not generally associated with the use of paper documents. Those risks include, for example and without limitation, alteration (inadvertent or intentional) and deterioration, both of which may not be readily apparent through casual observation.

12.1.3.3 The Owner, Contracting Authority, A/E, and Contractor do not warrant to each other that any Electronic File they provide **(1)** was not altered through transmission; **(2)** is compatible with the recipient's computer system or software; **(3)** will not be altered through degradation of the recipient's storage media; or **(4)** is suitable for conversion/translation to and subsequent use in a system or format other than the Electronic File's original system or format.

12.1.3.4 Before relying on any Electronic File it receives, the recipient is responsible for verifying that the Electronic File was not altered through transmission, degradation of the recipient's own storage media, or other causes.

12.1.3.5 If the recipient of an Electronic File converts/translates the Electronic File from its original system or format to an alternate system or format, the recipient assumes the risk that the conversion/translation created errors in the converted/translated file.

12.1.3.6 The Owner, Contracting Authority, A/E, and Contractor shall each maintain and operate its own computer systems and storage media in a commercially reasonable way and take reasonable steps to prevent errors in and deterioration of the Electronic Files it creates, provides, and receives.

12.1.3.7 In the event of a discrepancy between information contained in a paper version of a document and the Electronic File of that document, the paper version will govern.

12.1.3.8 This **Section 12.1.3** does not relieve the Contractor of its responsibility for the preparation, completeness, or accuracy of the Contractor's Documents.

12.2 Public Relations

12.2.1 Publicity prior to completion of the Project. Prior to completion of the Project, public relations or publicity about the Project shall be solely within the control, and with the consent of, the Owner.

12.2.2 Publicity after completion of the Project. After completion of the Project, the Contractor may exercise reasonable public relations and marketing efforts related to the Project, provided the Contractor properly identifies the Owner and Contracting Authority, and their participation in the Project.

12.2.3 Professional Photography. If the Contractor commissions photography of the completed Project, the Contractor shall include in its photography agreements a release for unrestricted and unlimited use of photographs by the Owner and Contracting Authority, and shall provide the Owner and Contracting Authority with a reasonable quantity of photographs for use in the Owner's and the Contracting Authority's marketing and awareness activities, including, but not limited to, profiles of the Project on their respective websites.

12.2.4 Craft Awards and Other Recognition. If the Contractor submits the Project for craft awards or other similar venues for recognition of the Project, the Contractor shall properly identify the Owner and Contracting Authority, and their participation in the Project. In addition, if the Project receives any craft award or other recognition, the Contractor shall provide duplicate copies of the award plaque or other memento of the award to the Owner and Contracting Authority.

12.3 Application and Governing Law

12.3.1 The Contract and the rights of the parties thereunder shall be governed by the laws of the state of Ohio and only Ohio courts shall have jurisdiction over any action or proceeding concerning the Contract and/or performance thereunder. The Contractor irrevocably consents to such jurisdiction.

12.3.2 The parties to the Contract shall comply with Applicable Law.

12.3.3 Other rights and responsibilities of the Contractor, A/E, Contracting Authority, and Owner are set forth throughout the Contract Documents and included under different titles, articles, and paragraphs for convenience.

12.4 Conditions of the Contract

12.4.1 These General Conditions govern, take precedence over, and shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Conditions prepared by the Contracting Authority and approved by the Ohio Facilities Construction Commission.

12.5 Notice of Commencement.

12.5.1 The Contracting Authority shall prepare a Notice of Commencement and make it available as required under ORC Section 1311.252.

12.5.2 Upon request, the Contracting Authority or the Contractor shall furnish the Notice of Commencement to Subcontractors or any other member of the public.

12.6 Written Notice

12.6.1 Notice under the Contract Documents shall be validly given if:

12.6.1.1 delivered personally to a member of the organization for whom the notice is intended;

12.6.1.2 delivered by trackable delivery service, or sent by registered or certified mail, to the last known business address of the organization; or

12.6.1.3 delivered by facsimile, email, or project management software.

12.6.2 When the Owner, Contracting Authority, A/E, or Contractor gives notice to one of the other three, it shall also simultaneously send a copy of that notice to the others.

12.6.3 A copy of all notices, certificates, requests, or other communications to the Contracting Authority shall be sent to the Project Manager.

12.6.4 In the event of an emergency involving the Project, including, but not limited to, a fatality, serious injury, fire, collapse, flood, utility, or power loss to occupied facilities, explosion, or environmental damage, the Contractor shall immediately notify the A/E, Contracting Authority, and Owner by the most expedient means available.

12.6.5 The Contracting Authority, Owner, A/E, or Contractor may, by written notice given hereunder, designate addresses, telephone numbers, email addresses, or facsimile numbers to which notices, certificates, requests, or communications shall be sent.

12.7 Taxes

12.7.1 Only those materials that ultimately become a part of the completed structure or improvement that constitutes the Project shall be exempt from state sales tax and state use tax.

12.7.2 The purchase, lease, or rental of material, equipment, parts, or expendable items as concrete form lumber, tools, oils, greases, and fuels, which are used in connection with the Work, are subject to the application of state sales tax and state use tax.

12.8 Computing Time

12.8.1 When the Contract Documents refer to a period of time by a number of days, the period shall be computed to exclude the first and include the last day of the period. If the last day of the period falls on a Saturday, Sunday, or a Legal Holiday, that day shall be omitted from the computation and the period shall end on the next succeeding day that is not a Saturday, Sunday, or Legal Holiday.

12.8.2 Except as excluded under **Section 12.8.1**, the Contract Times and all other periods referred to in the Contract Documents includes Saturdays, Sundays, and all days defined as Legal Holidays in the Contracting Definitions.

12.8.3 The standard workdays for State projects are Monday through Friday, excluding Legal Holidays.

12.9 Time of the Essence

12.9.1 Time limits stated in the Contract Documents are of the essence of the Contract and all obligations under the Contract. By signing the Agreement, the Contractor acknowledges that the Contract Times are reasonable, taking into consideration the usual weather and other conditions prevailing in the locality of the Project. By signing the Construction Schedule, the Contractor acknowledges that the specified Milestone dates are reasonable, taking into consideration the usual weather and other conditions prevailing in the locality of the Project.

12.9.1.1 The Contractor acknowledges that the Owner has entered into, or may enter into, agreements for use of all or part of the premises where the Work is to be completed based upon the Contractor achieving Substantial Completion within the associated Contract Time.

12.9.1.2 The Contractor shall perform the Work in a reasonable, efficient, and economical sequence, and in the order and time as provided in the Construction Progress Schedule.

12.9.1.3 The Contractor acknowledges that it may be subject to interference, disruption, hindrance, or delay in the progress of the Work from any cause.

12.10 Successors and Assigns

12.10.1 The Contracting Authority and Contractor each bind themselves, their successors, assigns, and legal representatives, to the other party to this Contract and to the successors, assigns, and legal representatives of the other party with respect to all terms of this Contract.

12.10.2 The Contracting Authority and Contractor each acknowledge that the Owner is an intended third-party beneficiary of this Contract.

12.10.3 The Contractor shall not assign or transfer any right, title, or interest in this Contract without the Contracting Authority's prior written consent.

12.11 Extent of Contract

12.11.1 Entire Contract. Contract Documents represent the entire and integrated agreement between the Contracting Authority and Contractor and supersede all prior negotiations, representations, or agreements, either written or oral.

12.11.2 Multiple Counterparts. This Contract may be executed in any number of counterparts, each of which shall be regarded as an original and all of which shall constitute but one and the same instrument.

12.11.3 Captions. The captions and headings in this Contract are for convenience only and in no way define, limit, or describe the scope or intent of any provisions or sections hereof.

12.11.4 Precedence. In the event of a conflict or inconsistency between these General Conditions and any other Contract Documents (except Supplementary General Conditions), these General Conditions take precedence. In the event of a conflict or inconsistency between these General Conditions and Supplementary Conditions, the Supplementary Conditions take precedence.

12.12 Severability

12.12.1 If any term or provision of this Contract or the application thereof to any Person or circumstance, is finally determined to be invalid or unenforceable by a court of competent jurisdiction, the remainder of this Contract or the application of such term or provision to other Persons or circumstances, shall not be affected thereby, and each term and provision of this Contract shall be valid and enforced to the fullest extent permitted by Applicable Law.

12.13 Electronic and Facsimile Signatures

12.13.1 Any party hereto may deliver a copy of its counterpart signature page to this Contract via electronic signature software, fax, e-mail, or project management software. Each party hereto shall be entitled to rely upon an electronic, scanned, or facsimile signature of any other party delivered in such a manner as if such signature were an original.

12.14 No Third-Party Interest

12.14.1 Except as expressly provided under **Sections 6.2.2** through **6.2.5** and **Section 12.10.2**, **(1)** no person or entity, other than the Contracting Authority, Owner, and Contractor, will have any right or interest under the Contract, and **(2)** the Contract does not create a contractual relationship of any kind between any people or entities other than the Contracting Authority, Owner, and Contractor.

12.15 Ohio Retirement System

12.15.1 All individuals employed by the Contractor that provide personal services to the Contracting Authority or Owner are not public employees for the purposes of ORC Chapter 145, as amended.

12.15.2 If the Contractor is a PERS retirant, as defined by ORC Section 145.38, the Contractor shall notify the Contracting Authority of such status in writing prior to commencement of Work. The Contracting Authority, Owner, or State is not responsible for changes to the Contractor's retirement benefits resulting from entering into this Contract.

12.16 No Waiver

12.16.1 The failure of the Contracting Authority or Contractor to insist in any one or more instances upon the strict performance of any one or more of the provisions of the Contract or to exercise any rights under the Contract or provided by law will not be construed as a waiver or relinquishment of that provision or right or of the right to subsequently demand strict performance or exercise the right and the rights will continue unchanged and remain in full force and effect.

12.17 Rights and Remedies

12.17.1 The duties, obligations, rights, and remedies under the Contract are in addition to and not a limitation of the duties, obligations, rights, and remedies otherwise imposed by or available under Applicable Law.

12.18 Survival of Obligations

12.18.1 All representations, indemnity obligations, warranties, guarantees, and necessarily continuing obligations under the Contract, will survive final payment, completion and acceptance of the Work, and termination or completion of the Contract.

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Document 00 73 43 - Wage Rate Requirements
State of Ohio Standard Requirements for Public Facility Construction

PREVAILING WAGE RATES

1.1 Payment of Prevailing Wage Rates

1.1.1 The Contractor shall pay the prevailing wage rates of the Project locality, as issued by the Ohio Department of Commerce, Wage and Hour Bureau to laborers and mechanics performing Work on the Project.

1.1.2 The Contractor shall comply with the provisions, duties, obligations, and is subject to the remedies and penalties of ORC Chapter 4115.

1.1.3 If the Contractor or its Subcontractors fail to comply with ORC Chapter 4115, the Contracting Authority may withhold payment pursuant to **Section 9.8.2.5** of the **General Conditions**. The Contractor is liable for violations committed by the Contractor or its Subcontractors to the extent provided in ORC Chapter 4115.

1.1.4 The Contractor shall submit all payroll reports in compliance with the requirements of **Section 1.2** for all employees of the Contractor and of the Contractor's Subcontractors.

1.1.5 By executing a Contract, the Contractor certifies that it based its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.14, which are inserted at the end of this Document.

1.2 Prevailing Wage Rate Revisions

1.2.1 The Contracting Authority shall, within 7 business days after receipt of a notice of a change in the prevailing wage rates, notify the Contractor of the change. The prevailing wage rates are available at the Ohio Department of Commerce's web site: http://com.state.oh.us/.

1.2.2 The Contractor shall pay any revised wage rates issued during the term of the Contract.

1.3 Payroll Schedule

1.3.1 Within 10 days of the date of the Notice to Proceed, the Contractor shall provide the Contracting Authority's Prevailing Wage Coordinator a schedule of dates during the term of the Contract on which wages shall be paid to employees for the Project.

1.4 Payroll Reports

1.4.1 The Contractor shall submit payroll reports with each Contractor Payment Request, which reports shall be certified by the Contractor that the payroll is correct and complete, and that the wage rates shown are not less than those required by the Contract. The Contractor is responsible for submitting all payroll reports of its Subcontractors.

1.4.1.1 Each payroll report shall indicate the period covered and include a list containing the name, address, and last four digits of the social security number of each employee of the Contractor and its Subcontractors paid for the Work.

1.4.1.2 Each payroll report shall list the number of hours each employee worked each day on the Project during the reporting period, the total hours each week on the Project, the employee's hourly rate of pay, job classification, hourly rate of fringe benefits, and all deductions from wages and net pay.

1.4.1.3 Each payroll report shall list each fringe benefit and state if it is paid as cash to the employee or to a named plan.

1.4.1.4 The Contractor and its Subcontractors shall submit apprenticeship agreements for all apprentices utilized on the Project with the first payroll report from the Contractor or its Subcontractor that includes apprentices.

END OF DOCUMENT

Prevailing Wage Rate
Skilled Crafts

Name of Union: Asbestos Local 207

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Asbestos Worker	8/6/2025	8/6/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Asbestos Abatement	$32.50		$10.95	$7.25	$0.75	$3.75	$0.00	$0.05	$0.00	$0.00	$55.25	$71.50
Apprentice	BHR	Percent										
Trainee	$22.00	$67.69	$10.95	$1.90	$0.75	$1.00	$0.00	$0.05	$0.00	$0.00	$36.65	$47.65

(*)Special Calculation Note :

Other: Drug Testing

Ratio :

3 Journeymen to 1 Trainee

Jurisdiction (* denotes special jurisdictional note) :

Adams, Ashland, Ashtabula*, Athens, Auglaize, Brown, Butler*, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Delaware, Erie*, Fairfield, Fayette, Franklin, Geauga, Greene, Guernsey, Hamilton, Hardin, Harrison, Highland, Hocking, Holmes, Huron, Knox, Lake, Licking, Logan, Lorain, Madison, Mahoning, Marion, Medina, Miami, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Portage, Preble, Richland, Ross, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Vinton, Warren*, Wayne

Special Jurisdictional Note :

Ashtabula County: (post offices & townships of Ashtabula, Austinburg, Geneva, Harperfield, Jefferson, Plymouth & Saybrook) (townships of Andover, Cherry Valley, Colbrook, Canneaut, Denmark, Dorset, East Orwell, Hartsgrove, Kingville, Lenox, Monroe,Morgan,New Lyme,North Kingsville, Orwell, Pierpoint, Richmond Rock Creek, Rome, Shefield, Trumbull, Wayne, Williamsfield & Windsor)

Butler County: (townships of Fairfield, Hanover, Liberty, Milford, Morgan, Oxford, Ripley, Ross, St. Clair, Union & Wayne) (Lemon & Madison)

Erie County: (post offices & townships of Berlin, Berlin Heights,Birmingham,Florence, Huron, Milan, Shinrock & Vermilion)

Warren County: (townships of: Deerfield, Hamilton, Harlan, Salem, Union & Washington) (Clear Creek, Franklin, Mossie, Turtle Creek & Wayne)

Details :

An Abatement Journeyman is anyone who has more than 600 hours in the Asbestos Abatement field.

Asbestos & lead paint abatement including, but not limited to the removal or encapsulation of asbestos & lead paint, all work in conjunction with the preparation of the removal of same & all work in conjunction with the clean up after said removal. The removal of all insulation materials, whether they contain asbestos or not, from mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) is recognized as being the exclusive work of the Asbestos Abatement Workers.

On all mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) that are going to be demolished, the removal of all insulating materials whether they contain asbestos or not shall be the exclusive work of the Laborers.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Asbestos Local 50 Heat & Frost Insulators

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN02-2025ib	Asbestos Worker	7/30/2025	7/30/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Asbestos Insulation Mechanic	$40.56		$9.55	$9.60	$0.55	$0.00	$4.75	$0.00	$0.00	$0.00	$65.01	$85.29
Firestop Technician	$40.56		$9.55	$9.60	$0.55	$0.00	$4.75	$0.00	$0.00	$0.00	$65.01	$85.29
Apprentice	BHR	Percent										
1st year	$25.81	$63.63	$9.55	$4.52	$0.50	$0.00	$0.50	$0.00	$0.00	$0.00	$40.88	$53.78
2nd year	$30.11	$74.23	$9.55	$4.52	$0.50	$0.00	$0.85	$0.00	$0.00	$0.00	$45.53	$60.59
3rd year	$34.41	$84.83	$9.55	$6.76	$0.50	$0.00	$1.25	$0.00	$0.00	$0.00	$52.47	$69.67
4th year	$36.56	$90.13	$9.55	$6.76	$0.50	$0.00	$1.50	$0.00	$0.00	$0.00	$54.87	$73.15

(*)Special Calculation Note :

Ratio :

1 Journeymen to 1 Apprentice
4 Journeymen to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

Athens, Auglaize, Butler*, Champaign, Clark, Clinton, Crawford, Darke, Delaware, Fairfield, Fayette, Franklin, Greene, Guernsey, Hardin, Hocking, Knox, Licking, Logan, Madison, Marion, Miami, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Preble, Ross, Shelby, Union, Vinton, Warren*

Special Jurisdictional Note :

Butler County: Townships of Lemon and Madison.
Warren County: Township of Clear Creek, Franklin, Massie, Turtle Creek and Wayne

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Boilermaker Local 105

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN02-2013fb	Boilermaker	10/1/2013	10/1/2013

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Boilermaker	$35.26		$7.07	$13.28	$0.89	$0.00	$3.00	$0.55	$0.00	$0.00	$60.05	$77.68
Apprentice	BHR	Percent										
1st 6 months	$24.69	$70.03	$7.07	$11.30	$0.89	$0.00	$2.10	$0.55	$0.00	$0.00	$46.60	$58.95
2nd 6 months	$26.45	$75.02	$7.07	$11.30	$0.89	$0.00	$2.25	$0.55	$0.00	$0.00	$48.51	$61.74
3rd 6 months	$28.21	$80.00	$7.07	$11.30	$0.89	$0.00	$2.40	$0.55	$0.00	$0.00	$50.42	$64.52
4th 6 months	$29.98	$85.02	$7.07	$11.30	$0.89	$0.00	$2.55	$0.55	$0.00	$0.00	$52.34	$67.33
5th 6 months	$30.86	$87.52	$7.07	$13.28	$0.89	$0.00	$2.63	$0.55	$0.00	$0.00	$55.28	$70.71
6th 6 months	$31.74	$90.03	$7.07	$13.28	$0.89	$0.00	$2.70	$0.55	$0.00	$0.00	$56.23	$72.11
7th 6 months	$32.62	$92.50	$7.07	$13.28	$0.89	$0.00	$2.78	$0.55	$0.00	$0.00	$57.19	$73.49
8th 6 months	$33.50	$95.00	$7.07	$13.28	$0.89	$0.00	$2.85	$0.55	$0.00	$0.00	$58.14	$74.89

(*)Special Calculation Note :

Other is Supplemental Health and Welfare

Ratio :

5 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Athens, Brown, Butler, Champaign, Clark, Clermont, Clinton, Fairfield, Fayette, Franklin, Gallia, Greene, Guernsey, Hamilton, Highland, Hocking, Jackson, Lawrence, Licking, Madison, Meigs, Miami, Montgomery, Morgan, Muskingum, Noble, Perry, Pickaway, Pike, Preble, Ross, Scioto, Vinton, Warren

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Bricklayer Local 23 Heavy Hwy (A)

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2024ib	Bricklayer	6/5/2024	6/5/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason Bricklayer Sewer Water Works A	$33.39		$10.00	$9.53	$0.53	$0.00	$0.00	$0.00	$0.00	$0.00	$53.45	$70.15
Apprentice	BHR	Percent										
1st year	$23.37	$70.00	$10.00	$9.53	$0.53	$0.00	$0.00	$0.00	$0.00	$0.00	$43.43	$55.12
2nd year	$26.71	$80.00	$10.00	$9.53	$0.53	$0.00	$0.00	$0.00	$0.00	$0.00	$46.77	$60.13
3rd year	$30.05	$90.00	$10.00	$9.53	$0.53	$0.00	$0.00	$0.00	$0.00	$0.00	$50.11	$65.14

(*)Special Calculation Note :

NOT FOR BUILDING CONSTRUCTION.

Ratio :

3 Journeymen to 1 Apprentice 6 Journeymen to 2 Apprentice 9 Journeymen to 3 Apprentice 12 Journeymen to 4 Apprentice 15 Journeymen to 5 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Geauga, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

(A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work. (B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Bricklayer Local 23 Heavy Hwy (B)

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2024ib	Bricklayer	6/5/2024	6/5/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason Bricklayer Power Plants Tunnels Amusement Parks B	$34.39		$10.00	$9.52	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$54.45	$71.65
Apprentice	BHR	Percent										
1st year	$24.07	$70.00	$10.00	$9.52	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$44.13	$56.17
2nd year	$27.51	$80.00	$10.00	$9.52	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$47.57	$61.33
3rd year	$30.95	$90.00	$10.00	$9.52	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$51.01	$66.49

(*)Special Calculation Note :

NOT FOR BUILDING CONSTRUCTION.

Ratio :

3 Journeymen to 1 Apprentice 6 Journeymen to 2 Apprentice 9 Journeymen to 2 Apprentice 12 Journeymen to 4 Apprentice 15 Journeymen to 5 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Geauga, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

(A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work. (B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Carpenter & Pile Driver SW District HevHwy

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Carpenter

Effective Date: 5/21/2025

Effective Date: 5/21/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Journeyman	$36.09		$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$59.09	$77.14
Apprentice	BHR	Percent										
1st 6 Months	$25.26	$70.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$48.26	$60.89
2nd 6 Months	$25.26	$70.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$48.26	$60.89
3rd 6 Months	$28.87	$80.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$51.87	$66.31
4th 6 Months	$28.87	$80.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$51.87	$66.31
5th 6 Months	$32.48	$90.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$55.48	$71.72
6th 6 Months	$32.48	$90.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$55.48	$71.72
7th 6 Months	$34.29	$95.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$57.29	$74.43
8th 6 Months	$34.29	$95.00	$9.42	$6.95	$0.70	$0.00	$5.77	$0.16	$0.00	$0.00	$57.29	$74.43

(*)Special Calculation Note :

Other is UBC National Fund.

Ratio :

1 Journeymen to 1 Apprentice An employer shall have the right to employ one (1) Apprentice for one (1) Journeyman Carpenter in its employment for the first Apprentice employed, and 1 (1) Apprentice for two (2) Journeyman Carpenter for additional Apprectices employed. Thereafter, every third additonal carpenter hired shall be an apprentice, if available, and if practical for the type of work being performed.

Jurisdiction (* denotes special jurisdictional note) :

Brown, Butler, Champaign, Clark, Clermont, Clinton, Darke, Greene, Hamilton, Logan, Miami, Montgomery, Preble, Shelby, Warren

Special Jurisdictional Note :

Details :

Highway Construction, Airport Construction, Heavy Construction but not limited to:(tunnels,subways,drainage projects,flood control,reservoirs). Railroad Construction,Sewer Waterworks & Utility Construction but not limited to: (storm sewers, waterlines, gaslines). Industrial & Building Site, Power Plant, Amusement Park, Athletic Stadium Site, Sewer and Water Plants. When the Contractor furnishes the necessary underwater gear for the Diver, the Diver shall be paid one and one half (1&1/2) times the journeyman rate for the time spent in the water.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Carpenter & Pile Driver SW Zone 1

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Carpenter	6/11/2025	6/11/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Carpenter	$33.34		$9.28	$6.95	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$54.17	$70.84
Pile Driver	$33.34		$9.28	$6.95	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$54.17	$70.84
Apprentice	BHR	Percent										
1st 6 Months	$23.34	$70.00	$9.28	$2.00	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$39.22	$50.89
2nd 6 Months	$23.34	$70.00	$9.28	$2.00	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$39.22	$50.89
3rd 6 Months	$26.67	$80.00	$9.28	$5.56	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$46.11	$59.45
4th 6 Months	$26.67	$80.00	$9.28	$5.56	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$46.11	$59.45
5th 6 Months	$30.01	$90.00	$9.28	$6.26	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$50.15	$65.15
6th 6 Months	$30.01	$90.00	$9.28	$6.26	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$50.15	$65.15
7th 6 Months	$31.67	$95.00	$9.28	$6.60	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$52.15	$67.99
8th 6 Months	$31.67	$95.00	$9.28	$6.60	$0.70	$0.00	$3.74	$0.16	$0.00	$0.00	$52.15	$67.99

(*)Special Calculation Note :

Other is for UBC National Fund

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Darke, Greene, Logan, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

Carpenter duties shall include but not limited to: Pile driving, milling,fashioning,joining,assembling,erecting,fastening, or dismantling of all material of wood,plastic,metal,fiber,cork,and composition, and all other substitute materials: pile driving,cutting,fitting,and placing of lagging, and the handling,cleaning,erecting,installing,and dismantling of machinery,equipment,and erecting pre-engineered metal buildings. Pile Drivers work but not limited to: unloading, assembling,erection,repairs,operation,signaling,dismantling, and reloading all equipment that is used for pile driving including pile butts. pile butts is defined as sheeting or scrap piling. Underwater work that may be required in connection with the installation of piling. The diver and his tender work as a team and shall arrive at their own financial arrangements with the contractor.Any configuration of wood, steel, concrete, or composite that is jetted, driven, or vibrated onto the ground by conventional pile driving equipment for the purpose of supporting a future load that may be permanent or temporary. Driving bracing,plumbing,cutting off and capping of all piling whether wood,metal,pipe piling or composite. loading, unloading, erecting, framing, dismantling, moving, and handling of pile driving equipment. piling used in the construction and repair of all wharves, docks, piers, trestles, caissons, cofferdams, and the erection of all sea walls and breakwaters. All underwater and marine work on bulkheads, wharves,docks,shipyards, caissons, piers, bridges, pipeline work, viaducts, marine cable and trestles, as well as salvage and reclamation work where divers are employed. Rate shall include carpenters, acoustic, and ceiling installers, drywall installers, pile drivers, and floorlayers.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Carpenter Floorlayer SW Local 2 & 136

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025sks	Carpenter	9/17/2025	9/17/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Carpenter Floorlayer	$31.74		$9.24	$6.95	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$52.06	$67.93
Apprentice	BHR	Percent										
1st 6 months	$22.22	$70.00	$9.24	$2.00	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$37.59	$48.70
2nd 6 months	$22.22	$70.00	$9.24	$2.00	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$37.59	$48.70
3rd 6 months	$25.39	$80.00	$9.24	$5.56	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$44.32	$57.02
4th 6 months	$25.39	$80.00	$9.24	$5.56	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$44.32	$57.02
5th 6 months	$28.57	$90.00	$9.24	$6.26	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$48.20	$62.48
6th 6 months	$28.57	$90.00	$9.24	$6.26	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$48.20	$62.48
7th 6 months	$30.15	$95.00	$9.24	$6.60	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$50.12	$65.19
8th 6 months	$30.15	$95.00	$9.24	$6.60	$0.70	$0.00	$3.27	$0.16	$0.00	$0.00	$50.12	$65.19

(*)Special Calculation Note :

Other: UBC National Fund and Install

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Brown, Butler, Champaign, Clark, Clermont, Clinton, Darke, Greene, Hamilton, Logan, Miami, Montgomery, Preble, Shelby, Warren

Special Jurisdictional Note :

Details :

Scope of work shall include, but not be limited to: receiving,unloading,handling,distribution and installation of all carpeting materials,carpet padding or matting materials and all resilient materials whether for use on walls, floors,counter, sink,table and all preparation work necessary in connection therewith, including sanding work. the installation of nonstructural under-layment and the work of removing, cleaning waxing of any of the above. Carpeting shall include any floor covering composed of either natural or synthetic fibers that are made in breadths to be sewed, fastened or directly glued to floors or over cushioning sound-proofing materials.Resilient Floors shall consist of and include the laying of all special designs of wood,wood block, wood composition, cork, linoleum, asphalt, mastic, plastic, rubber tile,whether nailed or glued.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Carpenter Millwright Local 1090 SW Zone II

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Carpenter

Effective Date: 9/10/2025

Effective Date: 9/10/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Carpenter Millwright	$36.42		$9.18	$6.95	$0.72	$0.00	$8.24	$0.19	$0.00	$0.00	$61.70	$79.91
Apprentice	BHR	Percent										
1st 6 months	$25.49	$70.00	$9.18	$4.87	$0.72	$0.00	$5.77	$0.19	$0.00	$0.00	$46.22	$58.97
2nd 6 months	$25.49	$70.00	$9.18	$4.87	$0.72	$0.00	$5.77	$0.19	$0.00	$0.00	$46.22	$58.97
3rd 6 months	$29.14	$80.00	$9.18	$5.56	$0.72	$0.00	$6.59	$0.19	$0.00	$0.00	$51.38	$65.95
4th 6 months	$29.14	$80.00	$9.18	$5.56	$0.72	$0.00	$6.59	$0.19	$0.00	$0.00	$51.38	$65.95
5th 6 months	$32.78	$90.00	$9.18	$6.26	$0.72	$0.00	$7.42	$0.19	$0.00	$0.00	$56.55	$72.94
6th 6 months	$32.78	$90.00	$9.18	$6.26	$0.72	$0.00	$7.42	$0.19	$0.00	$0.00	$56.55	$72.94
7th 6 months	$34.60	$95.00	$9.18	$6.60	$0.72	$0.00	$7.83	$0.19	$0.00	$0.00	$59.12	$76.42
8th 6 months	$34.60	$95.00	$9.18	$6.60	$0.72	$0.00	$7.83	$0.19	$0.00	$0.00	$59.12	$76.42

(*)Special Calculation Note :

Other ($0.19) $0.14 National Fund and $0.05 for National Millwright Fund.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Darke, Greene, Logan, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Cement Mason Local 132 (Dayton)

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Cement Mason	6/4/2025	6/4/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason	$32.71		$8.65	$7.35	$0.85	$0.00	$2.35	$0.07	$0.00	$0.00	$51.98	$68.34
Apprentice	BHR	Percent										
1st Year	$22.90	$70.00	$8.65	$7.35	$0.85	$0.00	$2.35	$0.07	$0.00	$0.00	$42.17	$53.62
2nd Year	$26.17	$80.00	$8.65	$7.35	$0.85	$0.00	$2.35	$0.07	$0.00	$0.00	$45.44	$58.52
3rd Year	$29.44	$90.00	$8.65	$7.35	$0.85	$0.00	$2.35	$0.07	$0.00	$0.00	$48.71	$63.43

(*)Special Calculation Note :

Other: International Training Fund

Ratio :

2 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Clinton, Darke, Greene, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

Cement Masons on outrigger, swing or hanging scaffolds, manlifts: $.75 per hour above scale up to twenty-five (25) feet and $.75 per hour for each additional twenty-five (25) feet or part of same. A Cement Mason operating a grinder: $.30 per hour above the journeyman scale.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Cement Mason Local 132 Hev Hwy (Dayton)

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Cement Mason

Effective Date: 5/1/2025

Effective Date: 5/1/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason	$37.24		$9.00	$7.65	$0.75	$0.00	$2.45	$0.07	$0.00	$0.00	$57.16	$75.78
Apprentice	BHR	Percent										
1st Year	$26.07	$70.00	$9.00	$7.65	$0.75	$0.00	$2.45	$0.07	$0.00	$0.00	$45.99	$59.02
2nd Year	$29.79	$80.00	$9.00	$7.65	$0.75	$0.00	$2.45	$0.07	$0.00	$0.00	$49.71	$64.61
3rd Year	$33.52	$90.00	$9.00	$7.65	$0.75	$0.00	$2.45	$0.07	$0.00	$0.00	$53.44	$70.19

(*)Special Calculation Note :

Other: International Training Fund

Ratio :

1 Journeyman to 1 Apprentice 2 Journeymen to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Clinton, Darke, Greene, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site, Heavy Construction, Airport Construction Or Railroad Construction Work, Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work, Pollution Control, Sewer Plant, Waste & Water Plant, Water Treatment Facilities Construction.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 71 DOT Traffic Signal Highway Lighting American Line Builders

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Electrical

Effective Date: 6/4/2025

Effective Date: 6/4/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Lineman	$46.03		$7.50	$1.38	$0.46	$0.00	$9.20	$0.50	$0.00	$0.00	$65.07	$88.09
Traffic Signal & Lighting Journeyman	$44.43		$7.50	$1.33	$0.44	$0.00	$8.89	$0.50	$0.00	$0.00	$63.09	$85.31
Equipment Operator	$40.44		$7.50	$1.21	$0.40	$0.00	$8.09	$0.50	$0.00	$0.00	$58.14	$78.36
Groundman 0 to 12 months (W/O CDL)	$24.52		$7.50	$0.74	$0.25	$0.00	$4.90	$0.50	$0.00	$0.00	$38.41	$50.67
Groundman 0 to 12 Months (W CDL)	$26.78		$7.50	$0.80	$0.27	$0.00	$5.36	$0.50	$0.00	$0.00	$41.21	$54.60
Groundman greater than 1 year (W CDL)	$29.07		$7.50	$0.87	$0.29	$0.00	$5.81	$0.50	$0.00	$0.00	$44.04	$58.58
Traffic Apprentice	$		$	$	$	$	$	$	$	$	$	$
1st 1000 hrs	$26.66		$7.50	$0.80	$0.27	$0.00	$5.33	$0.50	$0.00	$0.00	$41.06	$54.39
2nd 1000 hrs	$28.88		$7.50	$0.87	$0.29	$0.00	$5.78	$0.50	$0.00	$0.00	$43.82	$58.26
3rd 1000 hrs	$31.10		$7.50	$0.93	$0.31	$0.00	$6.22	$0.50	$0.00	$0.00	$46.56	$62.11
4th 1000 hrs	$33.32		$7.50	$1.00	$0.33	$0.00	$6.66	$0.50	$0.00	$0.00	$49.31	$65.97
5th 1000 hrs	$35.54		$7.50	$1.07	$0.36	$0.00	$7.11	$0.50	$0.00	$0.00	$52.08	$69.85
6th 1000 hrs	$39.99		$7.50	$1.20	$0.40	$0.00	$8.00	$0.50	$0.00	$0.00	$57.59	$77.59
Apprentice	BHR	Percent										
1st 1,000 Hours	$27.62	$60.00	$7.50	$0.83	$0.28	$0.00	$5.52	$0.50	$0.00	$0.00	$42.25	$56.06
2nd 1,000 Hours	$29.92	$65.00	$7.50	$0.90	$0.30	$0.00	$5.98	$0.50	$0.00	$0.00	$45.10	$60.06
3rd 1,000 Hours	$32.22	$70.00	$7.50	$0.97	$0.32	$0.00	$6.44	$0.50	$0.00	$0.00	$47.95	$64.06
4th 1,000 Hours	$34.52	$75.00	$7.50	$1.04	$0.35	$0.00	$6.90	$0.50	$0.00	$0.00	$50.81	$68.07
5th 1,000 Hours	$36.82	$80.00	$7.50	$1.10	$0.37	$0.00	$7.36	$0.50	$0.00	$0.00	$53.65	$72.07

6th 1,000 Hours	$39.13	$85.00	$7.50	$1.17	$0.39	$0.00	$7.82	$0.50	$0.00	$0.00	$56.51	$76.07
7th 1,000 Hours	$41.43	$90.00	$7.50	$1.24	$0.41	$0.00	$8.28	$0.50	$0.00	$0.00	$59.36	$80.07

(*)Special Calculation Note :

Other: Health Reimbursement Account

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Auglaize, Champaign, Clark, Clinton, Darke, Greene, Logan, Mercer, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

A groundman when directed shall assist a Journeymen in the performance of his/her work on the ground, including the use of hand tools. Under no circumstances shall this classification climb poles, towers, ladders, or work from an elevated platform or bucket truck. This classification shall not perform work normally assigned to an apprentice lineman. No more than three (3) Groundmen shall work alone. Jobs with more that three Groundmen shall be supervised by a Groundcrew Foreman, Journeyman Lineman, Journeyman Traffic Signal Technician or an Equipment Operator.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 71 High Tension Pipe Type Cable

Type of Rate: Commercial

Change #: LCN02-2024ib

Craft: Electrical

Effective Date: 1/6/2025

Effective Date: 1/6/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Lineman	$52.94		$7.50	$1.59	$0.53	$0.00	$12.71	$0.75	$0.00	$0.00	$76.02	$102.4
Certified Lineman Welder	$52.94		$7.50	$1.59	$0.53	$0.00	$12.71	$0.75	$0.00	$0.00	$76.02	$102.49
Certified Cable Splicer	$52.94		$7.50	$1.59	$0.53	$0.00	$12.71	$0.75	$0.00	$0.00	$76.02	$102.49
Operator A	$47.43		$7.50	$1.42	$0.47	$0.00	$11.38	$0.75	$0.00	$0.00	$68.95	$92.67
Operator B	$41.99		$7.50	$1.26	$0.42	$0.00	$10.08	$0.75	$0.00	$0.00	$62.00	$83.00
Operator C	$33.74		$7.50	$1.01	$0.34	$0.00	$8.10	$0.75	$0.00	$0.00	$51.44	$68.31
Groundman 0-12 months Exp	$26.47		$7.50	$0.79	$0.26	$0.00	$6.35	$0.75	$0.00	$0.00	$42.12	$55.36
Groundman 0-12 months Exp w/CDL	$29.12		$7.50	$0.87	$0.29	$0.00	$6.99	$0.75	$0.00	$0.00	$45.52	$60.08
Groundman 1 yr or more	$29.12		$7.50	$0.87	$0.29	$0.00	$6.99	$0.75	$0.00	$0.00	$45.52	$60.08
Groundman 1 yr or more w/CDL	$34.41		$7.50	$1.03	$0.34	$0.00	$8.26	$0.75	$0.00	$0.00	$52.29	$69.50
Equipment Mechanic A	$41.99		$7.50	$1.26	$0.42	$0.00	$10.08	$0.75	$0.00	$0.00	$62.00	$83.00
Equipment Mechanic B	$37.86		$7.50	$1.14	$0.38	$0.00	$9.09	$0.75	$0.00	$0.00	$56.72	$75.65
Equipment Mechanic C	$33.74		$7.50	$1.01	$0.34	$0.00	$8.10	$0.75	$0.00	$0.00	$51.44	$68.31
X-Ray Technician	$52.94		$7.50	$1.59	$0.53	$0.00	$12.71	$0.75	$0.00	$0.00	$76.02	$102.49
Apprentice	BHR	Percent										
1st 1000 hrs	$31.76	$60.00	$7.50	$0.95	$0.32	$0.00	$7.62	$0.75	$0.00	$0.00	$48.90	$64.79
2nd 1000 hrs	$34.41	$65.00	$7.50	$1.03	$0.34	$0.00	$8.26	$0.75	$0.00	$0.00	$52.29	$69.50
3rd 1000 hrs	$37.06	$70.00	$7.50	$1.11	$0.37	$0.00	$8.89	$0.75	$0.00	$0.00	$55.68	$74.21

4th 1000 hrs	$39.71	$75.00	$7.50	$1.19	$0.40	$0.00	$9.53	$0.75	$0.00	$0.00	$59.08	$78.93
5th 1000 hrs	$42.35	$80.00	$7.50	$1.27	$0.42	$0.00	$10.16	$0.75	$0.00	$0.00	$62.45	$83.63
6th 1000 hrs	$45.00	$85.00	$7.50	$1.35	$0.45	$0.00	$10.80	$0.75	$0.00	$0.00	$65.85	$88.35
7th 1000 hrs	$47.65	$90.00	$7.50	$1.43	$0.48	$0.00	$11.44	$0.75	$0.00	$0.00	$69.25	$93.07

(*)Special Calculation Note :

Other is Health Retirement Account Operator "A" John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater then 25 tons and less than 45 tons). Operator "B" Cranes (greater than 6 tons and up to 25 tons), Backhoes, Road Tractor, Dozer up to D-5, Pressure Digger- wheeled or tracked, all Tension wire Stringing equipment. Operator "C" Trench, Backhoe, Riding type vibratory Compactor, Ground Rod Driver, Boom Truck (6 ton & below), Skid Steer Loaders, Material Handler. *All Operators of cranes 45 ton or larger shall be paid the journeyman rate of pay. $0.30 is for Health Retirement Account.

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Delaware, Fairfield, Fayette, Franklin, Gallia, Geauga, Greene, Guernsey, Hamilton, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Pike, Portage, Preble, Richland, Ross, Scioto, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

Heli - Arc Welding will be paid $.30 above Journeyman rate. Additional compensation of 10% over the Journeyman Lineman and Journeyman Technician for performing work on structures outside of buildings such as water towers, smoke stacks, radio and television towers, more than 75' above the ground.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 71 Outside Utility Power

Type of Rate: Commercial

Change #: LCN01-2024ib

Craft: Electrical

Effective Date: 1/6/2025

Effective Date: 1/6/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Lineman	$50.15		$7.50	$1.50	$0.50	$0.00	$12.04	$0.75	$0.00	$0.00	$72.44	$97.52
Substation Technician	$50.15		$7.50	$1.50	$0.50	$0.00	$12.04	$0.75	$0.00	$0.00	$72.44	$97.52
Cable Splicer	$52.52		$7.50	$1.58	$0.52	$0.00	$12.60	$0.75	$0.00	$0.00	$75.47	$101.7
Operator A	$44.95		$7.50	$1.35	$0.45	$0.00	$10.79	$0.75	$0.00	$0.00	$65.79	$88.27
Operator B	$39.73		$7.50	$1.19	$0.40	$0.00	$9.53	$0.75	$0.00	$0.00	$59.10	$78.97
Operator C	$31.89		$7.50	$0.96	$0.32	$0.00	$7.65	$0.75	$0.00	$0.00	$49.07	$65.02
Groundman 0-12 months Exp	$25.07		$7.50	$0.75	$0.25	$0.00	$6.02	$0.75	$0.00	$0.00	$40.34	$52.88
Groundman 0-12 months Exp w/CDL	$27.58		$7.50	$0.83	$0.28	$0.00	$6.62	$0.75	$0.00	$0.00	$43.56	$57.35
Groundman 1 yr or more	$27.58		$7.50	$0.83	$0.28	$0.00	$6.62	$0.75	$0.00	$0.00	$43.56	$57.35
Groundman 1 yr or more w/CDL	$32.60		$7.50	$0.98	$0.33	$0.00	$7.82	$0.75	$0.00	$0.00	$49.98	$66.28
Equipment Mechanic A	$39.73		$7.50	$1.19	$0.40	$0.00	$9.54	$0.75	$0.00	$0.00	$59.11	$78.98
Equipment Mechanic B	$35.82		$7.50	$1.07	$0.36	$0.00	$8.60	$0.75	$0.00	$0.00	$54.10	$72.01
Equipment Mechanic C	$31.89		$7.50	$0.96	$0.32	$0.00	$7.65	$0.75	$0.00	$0.00	$49.07	$65.02
Line Truck w/uuger	$35.16		$7.50	$1.05	$0.35	$0.00	$8.44	$0.75	$0.00	$0.00	$53.25	$70.83
Apprentice	BHR	Percent										
1st 1000 hrs	$30.09	$60.00	$7.50	$0.90	$0.30	$0.00	$7.22	$0.75	$0.00	$0.00	$46.76	$61.81
2nd 1000 hrs	$32.60	$65.00	$7.50	$0.98	$0.33	$0.00	$7.82	$0.75	$0.00	$0.00	$49.98	$66.28
3rd 1000 hrs	$35.11	$70.00	$7.50	$1.05	$0.35	$0.00	$8.43	$0.75	$0.00	$0.00	$53.19	$70.74

4th 1000 hrs	$37.61	$75.00	$7.50	$1.13	$0.38	$0.00	$9.03	$0.75	$0.00	$0.00	$56.40	$75.21
5th 1000 hrs	$40.12	$80.00	$7.50	$1.20	$0.40	$0.00	$9.63	$0.75	$0.00	$0.00	$59.60	$79.66
6th 1000 hrs	$42.63	$85.00	$7.50	$1.28	$0.43	$0.00	$10.23	$0.75	$0.00	$0.00	$62.82	$84.13
7th 1000 hrs	$45.14	$90.00	$7.50	$1.35	$0.45	$0.00	$10.83	$0.75	$0.00	$0.00	$66.02	$88.58

(*)Special Calculation Note :

Other is Health Reimburstment Account Operator "A" John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater then 25 tons and less than 45 tons). Operator "B" Cranes (greater than 6 tons and up to 25 tons), Backhoes, Road Tractor, Dozer up to D-5, Pressure Digger- wheeled or tracked, all Tension wire Stringing equipment. Operator "C" Trench, Backhoe, Riding type vibratory Compactor, Ground Rod Driver, Boom Truck (6 ton & below), Skid Steer Loaders, Material Handler.

Ratio :

(1) Journeyman Lineman to (1) Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Delaware, Fairfield, Fayette, Franklin, Gallia, Geauga, Greene, Guernsey, Hamilton, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Pike, Portage, Preble, Richland, Ross, Scioto, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

Heli - Arc Welding will be paid $.30 above Journeyman rate. Additional compensation of 10% over the Journeyman Lineman and Journeyman Technician for performing work on structures outside of buildings such as water towers, smoke stacks, radio and television towers, more than 75' above the ground.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 71 Underground Residential Distribution

Type of Rate: Commercial

Change #: LCN02-2024ib

Craft: Electrical

Effective Date: 1/6/2025

Effective Date: 1/6/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
URD Electrican	$38.05		$7.50	$1.14	$0.38	$0.00	$9.13	$0.75	$0.00	$0.00	$56.95	$75.98
Equipment Operator A	$34.04		$7.50	$1.02	$0.34	$0.00	$8.17	$0.75	$0.00	$0.00	$51.82	$68.84
Equipment Operator B	$31.26		$7.50	$0.94	$0.31	$0.00	$7.50	$0.75	$0.00	$0.00	$48.26	$63.89
Directional Drill Locator	$34.04		$7.50	$1.02	$0.34	$0.00	$8.17	$0.75	$0.00	$0.00	$51.82	$68.84
Directional Drill Operator	$31.26		$7.50	$0.94	$0.31	$0.00	$7.50	$0.75	$0.00	$0.00	$48.26	$63.89
Groundman 0-12 months Exp	$24.70		$7.50	$0.74	$0.25	$0.00	$5.93	$0.75	$0.00	$0.00	$39.87	$52.22
Groundman 0-12 months Exp w/CDL	$27.24		$7.50	$0.82	$0.27	$0.00	$6.54	$0.75	$0.00	$0.00	$43.12	$56.74
Groundman 1 yr or more	$27.24		$7.50	$0.82	$0.27	$0.00	$6.54	$0.75	$0.00	$0.00	$43.12	$56.74
Groundman 1 yr or more w/CDL	$32.26		$7.50	$0.97	$0.32	$0.00	$7.74	$0.75	$0.00	$0.00	$49.54	$65.67
Apprentice	BHR	Percent										
1st 1000 hrs	$30.44	$80.00	$7.50	$0.91	$0.30	$0.00	$7.31	$0.75	$0.00	$0.00	$47.21	$62.43
2nd 1000 hrs	$32.34	$85.00	$7.50	$0.97	$0.32	$0.00	$7.76	$0.75	$0.00	$0.00	$49.64	$65.81
3rd 1000 hrs	$34.25	$90.00	$7.50	$1.03	$0.34	$0.00	$8.22	$0.75	$0.00	$0.00	$52.09	$69.21
4th 1000 hrs	$36.15	$95.00	$7.50	$1.08	$0.36	$0.00	$8.68	$0.75	$0.00	$0.00	$54.52	$72.59

(*)Special Calculation Note :

Other: Health Reimburstment Account

Ratio :

(1) Journeyman Lineman to (1) Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Delaware, Fairfield, Fayette, Franklin, Gallia, Geauga, Greene, Guernsey, Hamilton, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Pike, Portage, Preble, Richland, Ross, Scioto, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

This work applies to projects designated for any outside Underground Residential Distribution construction work for electrical utilities, municipalities and rural electrification projects.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 71 Voice Data Video Outside

Type of Rate: Commercial

Change #: LCN02-2024ib

Craft: Electrical

Effective Date: 3/6/2024

Effective Date: 3/6/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Installer Technician I	$35.39		$7.25	$1.06	$0.00	$0.00	$1.77	$0.00	$0.00	$0.00	$45.47	$63.17
Installer Technician II	$33.37		$7.25	$1.00	$0.00	$0.00	$1.67	$0.00	$0.00	$0.00	$43.29	$59.98
Installer Repairman	$33.37		$7.25	$1.00	$0.00	$0.00	$1.67	$0.00	$0.00	$0.00	$43.29	$59.98
Equipment Operator II	$24.98		$7.25	$0.75	$0.00	$0.00	$1.25	$0.00	$0.00	$0.00	$34.23	$46.72
Cable Splicer	$35.39		$7.25	$1.06	$0.00	$0.00	$1.77	$0.00	$0.00	$0.00	$45.47	$63.17
Ground Driver W/CDL	$16.69		$7.25	$0.50	$0.00	$0.00	$0.83	$0.00	$0.00	$0.00	$25.27	$33.62
Groundman	$14.57		$7.25	$0.44	$0.00	$0.00	$0.73	$0.00	$0.00	$0.00	$22.99	$30.28
Apprentice	BHR	Percent										
Trainee F	$17.70	$50.01	$7.25	$0.53	$0.00	$0.89	$0.00	$0.00	$0.00	$0.00	$26.37	$35.22
Trainee E	$20.53	$58.00	$7.25	$0.62	$0.00	$1.03	$0.00	$0.00	$0.00	$0.00	$29.43	$39.69
Trainee D	$23.36	$66.00	$7.25	$0.70	$0.00	$1.17	$0.00	$0.00	$0.00	$0.00	$32.48	$44.16
Trainee C	$26.19	$74.00	$7.25	$0.79	$0.00	$1.31	$0.00	$0.00	$0.00	$0.00	$35.54	$48.63
Trainee B	$29.02	$82.00	$7.25	$0.87	$0.00	$1.45	$0.00	$0.00	$0.00	$0.00	$38.59	$53.10
Trainee A	$31.85	$90.00	$7.25	$0.96	$0.00	$1.59	$0.00	$0.00	$0.00	$0.00	$41.65	$57.58

(*)Special Calculation Note :

Ratio :

1Trainee to 1 Journeyman

Jurisdiction (* denotes special jurisdictional note) :

Adams, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Delaware, Fairfield, Fayette, Franklin, Gallia, Geauga, Greene, Guernsey, Hamilton, Harrison, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Perry, Pickaway, Pike, Portage, Preble, Richland, Ross, Scioto, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Vinton, Warren, Washington, Wayne

Special Jurisdictional Note :

Details :

Cable Splicer: Inspect and test lines or cables, analyze results, and evaluate transmission characteristics. Cover conductors with insulation or seal splices with moisture-proof covering. Install, splice, test, and repair cables using tools or mechanical equipment. This will include the splicing of fiber. Installer Technician I: Must know all aspects of telephone and cable work. This is to include aerial, underground, and manhole work. Must know how to climb and run bucket. Must have all the tools required to perform these tasks. Must be able to be responsible for the safety of the crew at all times. Must also have CDL license and have at least 5 years experience. Installer Repairman: Perform tasks of repairing, installing, and testing phone and CATV services. Installer Technician II: Have at least three years of telephone and CATV experience. Must have the knowledge of underground, aerial, and manhole work. Must be able to climb and operate bucket. Must have CDL. Must have all tools needed to perform these tasks. Equipment Operator II: Able to operate a digger derrick or bucket truck. Have at least 3 years of experience and must have a valid CDL license. Groundman W/CDL: Must have a valid CDL license and be able to perform tasks such as: climbing poles, pulling down guys, making up material, and getting appropriate tools for the job. Must have at least 5 year's experience. Groundman: Perform tasks such as: climbing poles, pulling down guys, making up material, and getting appropriate tools for the job. Experience 0-5 years.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 82 Inside

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2024ib	Electrical	12/2/2024	12/2/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrician	$38.00		$7.85	$9.14	$0.65	$0.00	$4.05	$0.00	$0.00	$0.00	$59.69	$78.69
Apprentice	BHR	Percent										
1st period 0 - 1000 hrs	$17.48	$46.00	$4.40	$0.72	$0.30	$0.00	$0.00	$0.00	$0.00	$0.00	$22.90	$31.64
2nd period 1001-2000 hrs	$17.48	$46.00	$4.40	$0.72	$0.30	$0.00	$0.00	$0.00	$0.00	$0.00	$22.90	$31.64
3rd period 2001-3500 hrs	$19.00	$50.00	$7.35	$4.97	$0.32	$0.00	$2.03	$0.00	$0.00	$0.00	$33.67	$43.17
4th period 3501-5000 hrs	$19.76	$52.00	$7.37	$5.17	$0.34	$0.00	$2.11	$0.00	$0.00	$0.00	$34.75	$44.63
5th period 5001-6500 hrs	$23.56	$62.00	$7.47	$6.17	$0.40	$0.00	$2.51	$0.00	$0.00	$0.00	$40.11	$51.89
6th period 6501-8000 hrs	$29.26	$77.00	$7.62	$7.66	$0.50	$0.00	$3.12	$0.00	$0.00	$0.00	$48.16	$62.79

(*)Special Calculation Note :

Ratio :

1 to 3 Journeymen to 4 Apprentices 4 to 6 Journeymen to 8 Apprentices

Jurisdiction (* denotes special jurisdictional note) :

Clinton, Darke, Greene, Miami, Montgomery, Preble, Warren*

Special Jurisdictional Note :

The following townships in Warren County are included: Clearcreek, Franklin and Wayne.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 82 Inside Lt Commercial South West

Type of Rate: Commercial

Change #: LCN01-2024ib

Craft: Electrical

Effective Date: 10/30/2024

Effective Date: 10/30/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrician	$36.00		$7.55	$8.75	$0.61	$0.00	$4.00	$1.08	$0.00	$0.00	$57.99	$75.99
CE-3 10,001-12,000	$27.05		$6.67	$0.81	$0.87	$0.00	$0.81	$0.00	$0.00	$0.10	$36.31	$49.84
CE-2 9,001-10,000 Hrs	$21.64		$6.67	$0.65	$0.87	$0.00	$0.65	$0.00	$0.00	$0.10	$30.58	$41.40
CE-1 8,001-9,000 Hrs	$19.83		$6.67	$0.59	$0.87	$0.00	$0.59	$0.00	$0.00	$0.10	$28.65	$38.57
CW-4 6,001-8,000 Hrs	$18.03		$6.67	$0.54	$0.87	$0.00	$0.54	$0.00	$0.00	$0.10	$26.75	$35.77
CW-3 4,001-6,000 Hrs	$16.23		$6.67	$0.49	$0.87	$0.00	$0.49	$0.00	$0.00	$0.10	$24.85	$32.97
CW-2 2,001-4,000 Hrs	$15.33		$6.67	$0.46	$0.87	$0.00	$0.46	$0.00	$0.00	$0.10	$23.89	$31.56
CW-1 0-2,000 Hrs	$14.42		$6.67	$0.43	$0.87	$0.00	$0.43	$0.00	$0.00	$0.10	$22.92	$30.13
Apprentice	BHR	Percent										
1st period 0 - 1000 hrs	$16.56	$46.00	$4.18	$0.70	$0.28	$0.00	$0.00	$0.50	$0.00	$0.00	$22.22	$30.50
2nd period 1001-2000 hrs	$16.56	$46.00	$4.18	$0.70	$0.28	$0.00	$0.00	$0.50	$0.00	$0.00	$22.22	$30.50
3rd period 2001-3500 hrs	$18.00	$50.00	$7.05	$4.38	$0.31	$0.00	$2.00	$0.54	$0.00	$0.00	$32.28	$41.28
4th period 3501-5000 hrs	$18.72	$52.00	$7.07	$4.55	$0.32	$0.00	$2.08	$0.56	$0.00	$0.00	$33.30	$42.66
5th period 5001-6500 hrs	$22.32	$62.00	$7.17	$5.43	$0.38	$0.00	$2.48	$0.67	$0.00	$0.00	$38.45	$49.61
6th period 6501-8000 hrs	$27.72	$77.00	$7.32	$6.64	$0.47	$0.00	$3.08	$0.83	$0.00	$0.00	$46.06	$59.92

(*)Special Calculation Note :

Other: National Electrical Benefit Fund Misc: Administrative Fees

Ratio :

1 to 3 Journeymen to 4 Apprentices 4 to 6 Journeymen to 8 Apprentices Construction Electrician and Construction Wireman Ratio There shall be a minimum ratio of one inside Journeyman to every (4) employees of different classification per jobsite. An inside Journeyman Wireman is required on the project as the fifth (5th) worker or when apprentices are used.

Jurisdiction (* denotes special jurisdictional note) :

Clinton, Darke, Greene, Miami, Montgomery, Preble, Warren*

Special Jurisdictional Note :

The following townships in Warren County are included: Clearcreek, Franklin and Wayne. The scope of work for the light commercial agreement shall apply to the following facilities not to exceed 200,000 square feet; office buildings, shopping centers, auto sales agencies and garages, churches, funeral homes, nursing homes, hotels, retail and wholesale facilities, small stand-alone manufacturing facilities when free standing and not part of a larger facility (not to exceed 50,000 square fee), solar projects (500 panels or less) unless otherwise covered under the agreement, lighting retrofits (when not associated with remodels involving branch re-circuiting) lighting retrofits shall be defined as the changing of lamps and ballasts in existing light fixtures and shall also include the one for one replacement of existing fixtures, warehouses, gas stations, food service centers, restaurants, entertainment facilities, hospitals, clinics, motels, residential buildings.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 82 Lightning Rod

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN02-2022ib	Electrical	12/5/2022	12/5/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Lightning Rod Technican	$32.79		$7.45	$9.58	$0.00	$0.00	$3.50	$0.00	$0.00	$0.00	$53.32	$69.72
Apprentice	BHR	Percent										
	$	$	$	$	$	$	$	$	$	$	$	$

(*)Special Calculation Note :

No Apprentice approved by OSAC.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

Clinton, Darke, Greene, Miami, Montgomery, Preble, Warren*

Special Jurisdictional Note :

The following townships in Warren County are included: (Clearcreek, Franklin and Wayne)

Details :

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Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 82 Voice Data Video

Type of Rate: Commercial

Change #: LCN01-2024ib

Craft: Electrical

Effective Date: 11/27/2024

Effective Date: 11/27/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Installer Technician A	$27.70		$7.35	$7.83	$0.53	$0.00	$0.00	$0.00	$0.00	$0.00	$43.41	$57.26
Electrical Installer Technician B	$26.32		$7.35	$7.79	$0.50	$0.00	$0.00	$0.00	$0.00	$0.00	$41.96	$55.12
JW Installer Technician	$24.93		$7.35	$7.50	$0.47	$0.00	$0.00	$0.00	$0.00	$0.00	$40.25	$52.72
NON BICSI Installer	$18.01		$4.37	$0.00	$0.34	$0.00	$2.00	$0.00	$0.00	$0.00	$24.72	$33.73
Apprentice	BHR	Percent										
1st 0-1000 hours	$15.24	$55.00	$4.37	$4.31	$0.29	$0.00	$0.00	$0.00	$0.00	$0.00	$24.21	$31.82
2nd 1001-2000 hours	$15.24	$55.00	$4.37	$4.31	$0.29	$0.00	$0.00	$0.00	$0.00	$0.00	$24.21	$31.82
3rd 2001-3000 hours	$18.01	$65.02	$7.18	$5.09	$0.34	$0.00	$0.00	$0.00	$0.00	$0.00	$30.62	$39.63
4th 3001-4000 hours	$18.01	$65.02	$7.18	$5.09	$0.34	$0.00	$0.00	$0.00	$0.00	$0.00	$30.62	$39.63
5th 4001-5000 hours	$20.78	$75.02	$7.23	$5.87	$0.39	$0.00	$0.00	$0.00	$0.00	$0.00	$34.27	$44.66
6th 5001-6000 hours	$20.78	$75.02	$7.23	$5.87	$0.39	$0.00	$0.00	$0.00	$0.00	$0.00	$34.27	$44.66
7th 6001-7000 hours	$22.16	$80.00	$7.25	$7.66	$0.42	$0.00	$0.00	$0.00	$0.00	$0.00	$37.49	$48.57
8th 7001 hours	$22.16	$80.00	$7.25	$7.66	$0.42	$0.00	$0.00	$0.00	$0.00	$0.00	$37.49	$48.57
Cable Puller	$13.85	$50.00	$4.37	$0.00	$0.26	$0.00	$0.25	$0.00	$0.00	$0.00	$18.73	$25.66

(*)Special Calculation Note :

No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 2 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Clinton, Darke, Greene, Miami, Montgomery, Preble, Warren*

Special Jurisdictional Note :

The following townships in Warren County are included: (Clearcreek, Franklin and Wayne)

Details :

Work covered but not limited to: installation which utilize transmission and/or transference of voice, sound, vision or digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multimedia, multiplex, nurse call system, radio page, school intercom, sound and low voltage master clock systems. Fire Alarm work is excluded on all new construction sites or wherever the fire alarm system is installed in conduit. All HVAC control work is not covered by this wage rate but by the Inside Electrical wage rate.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Elevator Local 11

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Elevator	1/29/2025	1/29/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Elevator Mechanic	$57.41		$16.27	$10.96	$0.80	$4.59	$10.40	$2.16	$0.00	$0.00	$102.59	$131.3
Apprentice	BHR	Percent										
Probationary Apprentice	$28.71	$50.01	$0.00	$0.00	$0.00	$1.72	$0.00	$0.00	$0.00	$0.00	$30.43	$44.79
1st year	$31.58	$55.00	$16.27	$10.96	$0.80	$1.89	$10.40	$1.32	$0.00	$0.00	$73.22	$89.00
2nd year	$37.32	$65.00	$16.27	$10.96	$0.80	$2.24	$10.40	$1.56	$0.00	$0.00	$79.55	$98.20
3rd year	$40.19	$70.00	$16.27	$10.96	$0.80	$2.41	$10.40	$1.68	$0.00	$0.00	$82.71	$102.8
4th year	$45.93	$80.00	$16.27	$10.96	$0.80	$2.76	$10.40	$1.92	$0.00	$0.00	$89.04	$112.0
Helper	$40.19	$70.00	$16.27	$10.96	$0.80	$3.22	$10.40	$1.68	$0.00	$0.00	$83.52	$103.6
Assistant Mechanic	$45.93	$80.00	$16.27	$10.96	$0.80	$3.67	$10.40	$1.92	$0.00	$0.00	$89.95	$112.9

(*)Special Calculation Note :

Other: Holiday Pay

Ratio :

1 Journeyman to 1 Apprentice 1 Journeyman to 1 Helper 1 Journeyman to 1 Assistant Mechanic

Jurisdiction (* denotes special jurisdictional note) :

Adams, Brown, Butler, Clermont, Clinton, Darke, Greene, Hamilton, Highland, Miami, Montgomery, Preble, Scioto, Shelby, Warren

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Glazier Local 387

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2024ib	Glazier	11/1/2024	11/1/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Glazier	$33.85		$6.50	$11.60	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$52.40	$69.33
Apprentice	BHR	Percent										
1st Year	$22.00	$65.00	$6.50	$8.15	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$37.10	$48.10
2nd Year	$25.39	$75.00	$6.50	$9.14	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$41.48	$54.17
3rd Year	$28.77	$85.00	$6.50	$10.12	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$45.84	$60.23
4th Year	$32.16	$95.00	$6.50	$11.11	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$50.22	$66.30

(*)Special Calculation Note :

No special calculations for this skilled craft wage rate are required at this time.

Ratio :

Each employer may employ and train Apprentices in the following ratio to journeymen workers employed. 1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Brown, Butler, Champaign, Clark, Clermont, Clinton, Darke, Fayette*, Greene, Hamilton, Highland, Miami, Montgomery, Preble, Warren

Special Jurisdictional Note :

Fayette County: Eastern portion of route #41 being the dividing line between locals 372 and 387. Local 387 has jurisdiction of projects built on property which borders route #41 East.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Ironworker Local 290

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Ironworker	6/11/2025	6/11/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Ironworker Structural	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Welder	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Fence Erector	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Reinforcing Rods	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Machinery Mover	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Sheeter	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Metal Building Erector	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Rigger & Erector	$37.39		$9.50	$9.50	$0.85	$0.00	$5.50	$0.00	$0.00	$0.00	$62.74	$81.44
Apprentice	BHR	Percent										
1st Year	$23.93	$64.00	$9.50	$9.50	$0.85	$0.00	$4.00	$0.00	$0.00	$0.00	$47.78	$59.74
2nd Year	$27.67	$74.00	$9.50	$9.50	$0.85	$0.00	$4.00	$0.00	$0.00	$0.00	$51.52	$65.35
3rd Year	$31.41	$84.00	$9.50	$9.50	$0.85	$0.00	$4.00	$0.00	$0.00	$0.00	$55.26	$70.96
4th Year	$35.15	$94.00	$9.50	$9.50	$0.85	$0.00	$4.00	$0.00	$0.00	$0.00	$59.00	$76.57

(*)Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Allen*, Auglaize, Butler*, Champaign*, Clark*, Clinton, Darke, Fayette*, Greene, Hardin*, Highland*, Logan*, Madison*, Mercer*, Miami, Montgomery, Preble, Shelby, Van Wert*, Warren*

Special Jurisdictional Note :

Allen County Twps included are: Auglaize, Perry, Shawnee, Amanda, Spencer, Marion, Sugar Creek, American, Bath, Jackson. Butler County Twps included are: Milford, Wayne, Madison, Lemon. Champaign County Twps included are: Union, Urbana, Jackson, Concord, Salem, Mad River, Johnson, Harrison, Adams. Clark County Twps included are: Bethel, German, Green, Mad River, Moorefield, Pike, Springfield and potions of Harmony, Madison, and Pleasant Fayette County Twps included are: Green, Jasper, Concord, Jefferson. Hardin County Twps included are: Round Head, Marion, Liberty. Highland County Twps included are: Fairfield, Penn, Union, Marshall, Liberty, Paint, Brush Creek. Logan County Twps included are: Richland, Stokes, Bloomfield, Washington, Harrison, McArthur, Lake, Liberty, Pleasant, Miami. Madison County Twps included are: Stokes. Mercer County Twps included are: Dublin, Washington, Jefferson, Recovery, Gibson, Union, Liberty, Butler, Granville, Center, Hopewell, Franklin, Marion. VanWert County Twps included are: Jennings. Warren County Twps included are: Franklin, Clear Creek, Turtle Creek, Wayne, Massie, Washington, Salem, Union.

Details :

Structural Iron Work but not limited to:field fabrication, all loading to and including the erecting,rigging,assembly,dismantling, placing, temporary and permanent securing by any means of all structural iron,steel,ornamental lead,bronze,brass,copper,aluminum,glass all ferrous and non ferrous metal and composite material, precast prestressed and post-stressed concrete structures. Bridges and bridge rails,bridge viaducts,bucks bulkheads,bumper and bumper post,canopies and unistrut canopies,corrugated ferrous and non ferrous sheets when attached to steel frames,columns,beams,bar-joists,trusses,grinders,roof decking,electrical supports,elevator cars,elevator fronts and enclosures,erection of steel towers,flag poles, gymnasium equipment,stadium and arena seating,jail cell work,jail cell beds,benches,bunks,chairs,tables,mirrors,jail cell access doors,rigging and installation of machinery and equipment(erecting,aligning,anchoring and dismantling, erection and dismantling of tower cranes,derrick monorail systems, Chicago booms,overhead cranes,gantries,material and personnel hoists,tanks,hoppers and conveyors. All pre-engineered metal buildings and their entirety including siding,roofing, gutters, downspouts and erection of all. Ornamental Iron Work but not limited to:all work in connection with field fabrication,handling including loading/off loading,sorting,cutting,fastening,anchoring,bending,hoisting,placing,burning,welding,and tying,dismantling of all materials used in miscellaneous iron or steel, for stairs,hand railings,rolling doors, rolling gates,rolling shutters,fence,windows,curtain wall,erection and welding of all metal, sash,architectural and ornamental treatments, but not necessarily limited to all sizes and types of ornamental,steel iron,lead,bronze,brass,copper,aluminum,all ferrous and non ferrous metals and composite materials . Fence Erector Iron Worker but not limited to: All work in connection with the field fabrication and erection of chain link fence,which includes but not limited to the loading and of the fence fabric and posts also the installation of the above. Reinforcing Iron Worker but not limited to: work in connection with field fabrication, handling, racking, sorting, cutting, bending, hoisting, placing, burning, welding and tying all materials used to reinforce concrete construction, except loading and unloading by hand. Re-aligning of the reinforced iron, wire mesh placing, bricking, pulling and similar reinforcing materials, placing steel dowels, as well as re-fasten. Reinforcing steel and wire mesh in roadways and sidewalks in connection with building construction. Also, erection and fabrication of pre-connection with building construction, also erection and fabrication of pre-stressed and precast joists, beams, columns, slabs; walls, roofs, tanks, manholes, trenches and covers. Handling of "J" or jack bars on slip forms. Metal decking similar to "corruform" when used for floor forms over metal or concrete supports either welded or clipped. Post tension, all loading and unloading, hoisting, placing and tying of all post tensioning cables. Placing and tying of all duct work in bonded post tension. All of the wrecking of cones, wedging of the tendons, stressing, cutting, repairing and grouting of bonded post tension.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Labor HevHwy 3

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN02-2025ib	Laborer	6/11/2025	6/11/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Laborer Group 1	$37.27		$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$53.37	$72.01
Group 2	$37.44		$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$53.54	$72.26
Group 3	$37.77		$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$53.87	$72.76
Group 4	$38.22		$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$54.32	$73.43
Watch Person	$32.00		$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$48.10	$64.10
Apprentice	BHR	Percent										
0-1000 hrs	$29.82	$80.00	$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$45.92	$60.82
1001-2000 hrs	$31.68	$85.00	$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$47.78	$63.62
2001-3000 hrs	$33.54	$90.00	$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$49.64	$66.41
3001-4000 hrs	$35.41	$95.00	$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$51.51	$69.21
More than 4000 hrs	$37.27	$100.00	$8.60	$4.45	$0.45	$0.00	$2.50	$0.00	$0.10	$0.00	$53.37	$72.01

(*)Special Calculation Note :

Watchmen have no Apprentices. Tunnel Laborer rate with air-pressurized add $1.00 to the above wage rate. Commercial Driver's License – Any Laborer required to utilize a valid Commercial Driver's License (CDL), are in compliance with necessary FMCSA regulations and approved by the Contractor to operate a Commercial Motor Vehicle (CMV), shall be paid one dollar ($1.00) per hour above the base rate for the entirety of their working shift.

Ratio :

1 Journeymen to 1 Apprentice 3 Journeymen to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Delaware, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Madison, Marion, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Paulding, Perry, Pickaway, Pike, Preble, Putnam, Richland, Ross, Scioto, Seneca, Shelby, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wyandot

Special Jurisdictional Note :

Hod Carriers and Common Laborers - Heavy, Highway, Sewer, Waterworks, Utility, Airport, Railroad, Industrial and Building Site, Sewer Plant, Waste Water Treatment Facilities Construction

Details :

Group 1 Laborer (Construction); Plant Laborer or Yardman, Right-of-way Laborer, Landscape Laborer, Highway Lighting Worker, Signalization Worker, (Swimming) Pool Construction Laborer, Utility Man, *Bridge Man, Handyman, Joint Setter, Flagperson, Carpenter Helper, Waterproofing Laborer, Slurry Seal, Seal Coating, Surface Treatment or Road Mix Laborer, Riprap Laborer & Grouter, Asphalt Laborer, Dump Man (batch trucks), Guardrail & Fence Installer, Mesh Handler & Placer, Concrete Curing Applicator, Scaffold Erector, Sign Installer, Hazardous Waste (level D), Diver Helper, Zone Person and Traffic Control. *Bridge Man will perfomr work as per the October 31, 1949, memorandum on concrete forms, byand between the United Brotherhood of Caprpenters and Joiners of Americ and the Laborers' International Union of North America, which states in; "the moving, cleaning, oiling and carrying to the next point of erection, and the stripping of forms which are not to be re-used, and forms on all flat arch work shall be done by memebers of the Laborers' International Union of North America." Group 2 Asphalt Raker, Screwman or Paver, Concrete Puddler, Kettle Man (pipeline), All Machine-Driven Tools (Gas, Electric, Air), Mason Tender, Brick Paver, Mortar Mixer, Skid Steer, Sheeting & Shoring Person, Surface Grinder Person, Screedperson, Water Blast, Hand Held Wand, Power Buggy or Power Wheelbarrow, Paint Striper, Plastic fusing Machine Operator, Rodding Machine Operator, Pug Mill Operator, Operator of All Vacuum Devices Wet or Dry, Handling of all Pumps 4 inches and under (gas, air or electric), Diver, Form Setter, Bottom Person, Welder Helper (pipeline), Concrete Saw Person, Cutting with Burning Torch, Pipe Layer, Hand Spiker (railroad), Underground Person (working in sewer and waterline, cleaning, repairing and reconditioning). Tunnel Laborer (without air),Caisson, Cofferdam (below 25 feet deep), Air Track and Wagon Drill, Sandblaster Nozzle Person, Hazardous Waste (level B), ***Lead Abatement, Hazardous Waste (level C) ***Includes the erecting of structures for the removal, including the encapsulation and containment of Lead abatement process. Group 3 Blast and Powder Person, Muckers will be defined as shovel men working directly with the miners, Wrencher (mechanical joints & utility pipeline), Yarner, Top Lander, Hazardous Waste (level A), Concrete Specialist, Curb Setter and Cutter, Grade Checker, Concrete Crew in Tunnels. Utility pipeline Tappers, Waterline, Caulker, Signal Person will receive the rate equal to the rate paid the Laborer classification for which the Laborer is signaling. Group 4 Miner,Welder, Gunite Nozzle Person A.) The Watchperson shall be responsible to patrol and maintain a safe traffic zone including but not limited to barrels, cones, signs, arrow boards, message boards etc. The responsibility of a watchperson is to see that the equipment, job and office trailer etc. are secure.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Labor Local 1410 Building

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Laborer	5/7/2025	5/7/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Laborer Group 1	$32.40		$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$46.95	$63.15
Group 2	$33.00		$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$47.55	$64.05
Group 3	$33.50		$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$48.05	$64.80
Apprentice	BHR	Percent										
Building Laborer 1-1000 hrs	$25.92	$80.00	$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$40.47	$53.43
1001-2000	$27.54	$85.00	$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$42.09	$55.86
2001-3000	$29.16	$90.00	$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$43.71	$58.29
3001-4000	$30.78	$95.00	$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$45.33	$60.72
More than 4000 hrs	$32.40	$100.00	$8.60	$4.45	$0.40	$0.00	$1.00	$0.00	$0.10	$0.00	$46.95	$63.15

(*)Special Calculation Note :

$0.10 LECET is for Labor Management.

Ratio :

1 Journeymen to 1 Apprentice 4 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Darke, Greene, Logan, Miami, Montgomery, Preble

Special Jurisdictional Note :

Details :

Group 1 Building & Construction Laborer, Railroad Laborer, Asbestos & Hazardous Waste (Levels A,B,C, & D),Concrete Crew, Form Setter, Pipelayer, Bottom Man, Burner (Cutting Torch), Welder Helper, All Machine & Power Driven Tools, Sandblaster Yardman-Landscaping,Sewer Jet, Waterperson, Tool Cage Laborer,Unloading Furniture & Fixtures,Final Clean-Up Watchman, Residential Construction, Signal Men Group 2 Mason Tender For Bricklayers, Flexcore, Firebrick Tender (Blast Furnaces,Soaking Pits,Stoves & Stacks), Plasterer Tenders & Lathers Group 3 Tender Operator Asbestos, Lead and Hazardous Material: The removal, abatement or encapsulation of asbestos, lead and/or toxic and hazardous waste or materials is defined as all work included in the erection, moving servicing and dismantling of all enclosures, scaffolding, barricades, etc. and the operation of all tools and equipment (including generators, compressors and vacuums) normally used in the removal or abatement or asbestos, lead and toxic and hazardous waste or materials; the labeling, bagging, cartoning, crating or otherwise packaging of materials for disposal; as well as the clean-up of the work site and all other work incidental to the removal, abatement or encapsulation of asbestos, lead or toxic and hazardous waste materials. Level A Protective equipment is required when the area has been determined to contain extremely toxic contaminants or contaminants unknown but may be expected to be extremely toxic and/or immediately dangerous to life and health. This ensemble includes a fully encapsulated chemical suit, self contained breathing apparatus (SCBA) or airline fed respirator, and various types and numbers of boots and gloves. Level B Protective equipment includes a chemically resistant splash suit and a SCBA or airline respirator. This ensemble is required when the situation is very hazardous, such as oxygen deficient atmospheres, IDLH atmospheres, or confined space entries. Level C Protective equipment includes a protective suit and an air purifying respirator (APR) with the appropriate filter canisters. Level D To be worn only in established "safe zones" may consist of, from normal work clothes to normal skin protection such as gloves, face shields goggles, coveralls and occasionally respiratory protection.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Operating Engineers - Building Local 18 - Zone III

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Operating Engineer

Effective Date: 5/1/2025

Effective Date: 5/1/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Operator Group A	$45.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$62.74	$85.66
Operator Group B	$45.72		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$62.62	$85.48
Operator Group C	$44.68		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$61.58	$83.92
Operator Group D	$43.50		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$60.40	$82.15
Operator Group E	$38.04		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$54.94	$73.96
Master Mechanic	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Lift Director	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Cranes & Mobile Concrete Pumps 150'-180'	$46.34		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.24	$86.41
Cranes & Mobile Concrete Pumps 180'-249'	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Cranes & Mobile Concrete Pumps 249' and over	$47.09		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.99	$87.54
Apprentice	BHR	Percent										
1st Year	$22.92	$50.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$39.82	$51.28
2nd Year	$27.50	$60.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$44.40	$58.16
3rd Year	$32.09	$70.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$48.99	$65.03
4th Year	$36.67	$80.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$53.57	$71.91
Field Mechanic Trainee	$	$	$	$	$	$	$	$	$	$	$	$
1st Year	$27.50	$60.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$44.40	$58.16
2nd Year	$32.09	$70.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$48.99	$65.03
3rd Year	$36.67	$80.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$53.57	$71.91
4th Year	$41.26	$90.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$58.16	$78.78

(*)Special Calculation Note :

Other: Education & Safety Misc: National Training

Ratio :

For every (3) Operating Engineer Journeymen employed by the company there may be employed (1) Registered Apprentice or trainee Engineer through the referral when they are available. An apprenice, while employed as part of a crew per Article VIII, paragraph 77, will not be subject to the apprenticeship ratios in this collective bargaining agreement

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Coshocton, Crawford, Darke, Defiance, Delaware, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Madison, Marion, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wyandot

Special Jurisdictional Note :

Details :

Note: There will be a 10% increase for the apprentices on top of the percentages listed above provided they are operating mobile equipment. Group A- Barrier Moving Machines; Boiler Operators or Compressor Operators, when compressor or boiler is mounted on crane (Piggyback Operation); Boom Trucks (all types); Cableways Cherry Pickers; Combination - Concrete Mixers & Towers; All Concrete Pumps with Booms; Cranes (all types); Compact Cranes, track or rubber over 4,000 pounds capacity; Cranes self-erecting, stationary, track or truck (all configurations); Derricks (all types); Draglines; Dredges (dipper, clam or suction) 3-man crew; Elevating Graders or Euclid Loaders; Floating Equipment; Forklift (rough terrain with winch/hoist); Gradalls; Helicopter Operators, hoisting building materials; Helicopter Winch Operators, Hoisting building materials; Hoes (All types); Hoists (with two or more drums in use); Horizonal Directional Drill; Hydraulic Gantry (lift system); Laser Finishing Machines; Laser Screed and like equipment; Lift Slab or Panel Jack Operators; Locomotives (all types); Maintenance Operator/Technician(Mechanic Operator/Technician and/or Welder); Mixers, paving (multiple drum); Mobile Concrete Pumps, with booms; Panelboards, (all types on site); Pile Drivers; Power Shovels; Prentice Loader; Rail Tamper (with automatic lifting and aligning device); Rotary Drills (all), used on caissons for foundations and sub-structure; Side Booms; Slip Form Pavers; Straddle Carriers (Building Construction on site); Trench Machines (over 24” wide); Tug Boats. Group B - Articulating/end dumps (minus $4.00/hour from Group B rate); Asphalt Pavers; Bobcat-type and/or skid steer loader with hoe attachment greater than 7000 lbs.; Bulldozers; CMI type Equipment; Concrete Saw, Vermeer-type; Endloaders; Hydro Milling Machine; Kolman-type Loaders (Dirt Loading); Lead Greasemen; Mucking Machines; Pettibone-Rail Equipment; Power Graders; Power Scoops; Power Scrapers; Push Cats;, Rotomills (all), grinders and planers of all types. Group C - A-Frames; Air Compressors, Pressurizing Shafts or Tunnels; All Asphalt Rollers; Bobcat-type and/or Skid Steer Loader with or without attachments; Boilers (15 lbs. pressure and over); All Concrete Pumps (without booms with 5 inch system); Fork Lifts (except masonry); Highway Drills - all types (with integral power); Hoists (with one drum); House Elevators (except those automatic call button controlled), Buck Hoists, Transport Platforms, Construction Elevators; Hydro Vac/Excavator (when a second person is needed, the rate of pay will be “Class E”); Man Lifts; Material hoist/elevators; Mud Jacks; Pressure Grouting; Pump Operators (installing or operating Well Points or other types of Dewatering Systems); Pumps (4 inches and over discharge); Railroad Tie (Inserter/Remover); Rotovator (Lime-Soil Stabilizer); Submersible Pumps (4”and over discharge); Switch & Tie Tampers (without lifting and aligning device); Trench Machines (24” and under); Utility Operators. Group D - Backfillers and Tampers; Ballast Re-locator; Batch Plant Operators; Bar and Joint Installing Machines; Bull Floats; Burlap and Curing Machines; Clefplanes; Compressors, on building construction; Concrete Mixers, more than one bag capacity; Concrete Mixers, one bag capacity (side loaders); All Concrete Pumps (without boom with 4” or smaller system); Concrete Spreader; Conveyors, used for handling building materials; Crushers; Deckhands; Drum Fireman (in asphalt plants); Farm type tractors pulling attachments; Finishing Machines; Form Trenchers; Generators: Gunite Machines; Hydro-seeders; Pavement Breakers (hydraulic or cable); Post Drivers; Post Hole Diggers; Pressure Pumps (over 1/2”) discharge); Road Widening Trenchers; Rollers (except asphalt); Self-propelled sub-graders; Shotcrete Machines; Tire Repairmen; Tractors, pulling sheepsfoot post roller or grader; VAC/ALLS; Vibratory Compactors, with integral power; Welders. Group E – Allen Screed Paver (concrete); Boilers (less than 15 lbs. pressure); Cranes-Compact, track or rubber (under 4,000 pounds capacity); Directional Drill “Locator”; Fueling and greasing +$3.00; Inboard/outboard Motor Boat Launches; Light Plant Operators; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalperson, Submersible Pumps (under 4” discharge). Master Mechanics - Master Mechanic Cranes 150’ – 180’ - Boom & Jib 150 - 180 feet Cranes 180’ – 249’ - Boom & Jib 180 - 249 feet Cranes 250’ and over - Boom & Jib 250 feet or over

Prevailing Wage Rate
Skilled Crafts

Name of Union: Operating Engineers - HevHwy Zone II

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Operating Engineer

Effective Date: 5/1/2025

Effective Date: 5/1/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Operator Class A	$45.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$62.74	$85.66
Operator Class B	$45.72		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$62.62	$85.48
Operator Class C	$44.68		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$61.58	$83.92
Operator Class D	$43.50		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$60.40	$82.15
Operator Class E	$38.04		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$54.94	$73.96
Master Mechanic	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Lift Director	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Crane and Mobile Concrete Pump 150' - 179'	$46.34		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.24	$86.41
Crane and Mobile Concrete Pump 180' - 249'	$46.84		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.74	$87.16
Crane and Mobile Concrete Pump 250' and Ove	$47.09		$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$63.99	$87.54
Apprentice	BHR	Percent										
1st Year	$22.92	$50.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$39.82	$51.28
2nd Year	$27.50	$60.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$44.40	$58.16
3rd Year	$32.09	$70.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$48.99	$65.03
4th Year	$36.67	$80.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$53.57	$71.91
Field Mech Trainee	$	$	$	$	$	$	$	$	$	$	$	$
1st year	$27.50	$60.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$44.40	$58.16
2nd year	$32.09	$70.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$48.99	$65.03
3rd year	$36.67	$80.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$53.57	$71.91
4th year	$41.26	$90.00	$9.51	$6.25	$0.95	$0.00	$0.00	$0.09	$0.00	$0.10	$58.16	$78.78

(*)Special Calculation Note :

Other: Education & Safety Fund Misc: National Training

Ratio :

For every (3) Operating Engineer Journeymen employed by the company, there may be employed (1) Registered Apprentice or Trainee Engineer through the referral when they are available. An Apprentice, while employed as part of a crew per Article VIII, paragraph 68 will not be subject to the apprenticeship ratios in this collective bargaining agreement

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Coshocton, Crawford, Darke, Defiance, Delaware, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Lucas, Madison, Marion, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

**Apprentices wilt receive a 10% increase on top of the percentages listed above provided they are operating mobile equipment. Class A - Air Compressors on Steel Erection; Asphalt Plant Engineers (Cleveland District Only); Barrier Moving Machine; Boiler Operators, Compressor Operators, or Generators, when mounted on a rig; Boom Trucks (all types); Cableways; Cherry Pickers; Combination- Concrete Mixers & Towers; Concrete Plants (over 4 yd capacity); Concrete Pumps; Cranes (all types); Compact Cranes track or rubber over 4,000 pounds capacity; Cranes self-erecting stationary, track or truck; Derricks (all types); Draglines; Dredges dipper, clam or suction; Elevating Graders or Euclid Loaders; Floating Equipment (all types); Gradalls; Helicopter Crew (Operator- hoist or winch); Hoes (all types); Hoisting Engines; Hoisting Engines, on shaft or tunnel work; Hydraulic Gantry (lifting system); Industrial-type Tractors; Jet Engine Dryer (D8 or D9) diesel Tractors; Locomotives (standard gauge); Maintenance Operators/Technicians (class A); Mixers, paving (single or double drum); Mucking Machines; Multiple Scrapers; Piledriving Machines (all types); Power Shovels, Prentice Loader; Quad 9 (double pusher); Rail Tamper (with automatic lifting and aligning device); Refrigerating Machines (freezer operation); Rotary Drills, on caisson work; Rough Terrain Fork Lift with winch/hoist; Side Booms; Slip Form Pavers; Survey Crew Party Chiefs; Tower Derricks; Tree Shredders; Trench Machines (over 24" wide); Truck Mounted Concrete Pumps; Tug Boats; Tunnel Machines and /or Mining Machines; Wheel Excavators. Class B - Asphalt Pavers; Automatic Subgrade Machines, self-propelled (CMI-type); Bobcat-type and /or Skid Steer Loader with hoe attachment greater than 7000 lbs.; Boring Machine Operators (more than 48 inches); Bulldozers; Concrete Saws, Vermeer type; Endloaders; Horizontal Directional Drill (50,000 ft. lbs. thrust and over); Hydro Milling Machine; Kolman-type Loaders (production type-dirt); Lead Greasemen; Lighting and Traffic Signal Installation Equipment includes all groups or classifications; Maintenance Operators/Technicians, Class B; Material Transfer Equipment (shuttle buggy) Asphalt; Pettibone-Rail Equipment; Power Graders; Power Scrapers; Push Cats; Rotomills (all), Grinders and Planners of all types, Groovers (excluding walk-behinds); Trench Machines (24 inch wide and under). Class C - A-Frames; Air Compressors, on tunnel work (low Pressure); Articulating/straight bed end dumps if assigned (minus $4.00 per hour); Asphalt Plant Engineers (Portage and Summit Counties only); Bobcat-type and/or skid steer loader with or without attachments; Drones; Highway Drills (all types); HydroVac/Excavator (when a second person is needed, the rate of pay will be "Class E"); Locomotives (narrow gauge); Material Hoist/Elevators; Mixers, concrete (more than one bag capacity); Mixers, one bag capacity (side loader); Power Boilers (over 15 lbs. pressure); Pump Operators (installing or operating well Points); Pumps (4 inch and over discharge); Railroad Tie Inserter/Remover; Rollers, Asphalt; Rotovator (lime-soil Stabilizer); Switch & Tie Tampers (without lifting and aligning device); Utilities Operators, (small equipment); Welding Machines and Generators. Class D – Backfillers and Tampers; Ballast Re-locator; Bar and Joint Installing Machines; Batch Plant Operators; Boring Machine Operators (48 inch or less); Bull Floats; Burlap and Curing Machines; Concrete Plants (capacity 4 yds. and under); Concrete Saws (multiple); Conveyors (highway); Crushers; Deckhands; Farm type tractors, with attachments (highway); Finishing Machines; Firemen, Floating Equipment (all types); Fork Lifts (highway), except masonry; Form Trenchers; Hydro Hammers; Hydro Seeders; Pavement Breakers (hydraulic or cable); Plant Mixers; Post Drivers; Post Hole Diggers; Power Brush Burners; Power Form Handling Equipment; Road Widening Trenchers; Rollers (brick, grade, macadam); Self-Propelled Power Spreaders; Self-Propelled Sub-Graders; Steam Firemen; Survey Instrument men; Tractors, pulling sheepsfoot rollers or graders; Vibratory Compactors, with integral power. Class E - Compressors (portable, Sewer, Heavy and Highway); Cranes-Compact, track or rubber under 4,000 pound capacity; Drum Firemen (asphalt plant); Fueling and greasing (Primary Operator with Specialized CDL Endorsement Add $3.00/hr); Generators; Inboard-Outboard Motor Boat Launches; Masonry Fork Lifts; Oil Heaters (asphalt plant); Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalperson; Survey Rodmen or Chairmen; Tire Repairmen; VAC/ALLS. Master Mechanic - Master Mechanic Cranes and Mobile Concrete Pumps 150' -179' - Boom & Jib 150 - 179 feet Cranes and Mobile Concrete Pumps 180' - 249' - Boom & Jib 180 - 249 feet Cranes and Mobile Concrete Pumps 250' and over - Boom & Jib 250 feet or over

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 249

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Painter	5/21/2025	5/21/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Painter	$29.15		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$43.12	$57.70
Apprentice	BHR	Percent										
30 Day Probationary	$14.58	$50.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$21.86	$29.14
1st Year	$18.95	$65.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$26.23	$35.70
2nd Year	$21.86	$75.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$29.14	$40.07
3rd Year	$24.78	$85.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$32.06	$44.45
4th Year	$26.24	$90.02	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$33.52	$46.64

(*)Special Calculation Note :

A) $1.50 an hour premium shall be added to any base pay for spraying Coal Tar Products. B) $ .75 an hour premium shall be added to any base pay for Sandblasting, Water Blasting or Lead Abatement. C) $ .90 an hour premium shall be added to any base pay for Drywall Finishing. D) $3.94 an hour premium shall be added to any base pay for Elevated Tanks. E) $ .95 an hour premium shall be added to any base pay for Steeplejack Work.

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Clark, Darke, Greene, Miami, Montgomery, Preble

Special Jurisdictional Note :

Details :

Industrial work but not limited to:work done on industrial plants, repair garages, processing plants,storage tanks, warehouses, skeleton structures,bridges,whether new or old construction, office buildings in industrial sites and interior of shopping malls.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 249 Drywall

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Painter	5/21/2025	5/21/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Painter Drywall Finisher	$29.15		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$43.12	$57.70
Apprentice	BHR	Percent										
30 Day Probationary	$14.58	$50.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$21.86	$29.14
1st Year	$18.95	$65.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$26.23	$35.70
2nd Year	$21.86	$75.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$29.14	$40.07
3rd Year	$24.78	$85.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$32.06	$44.45
4th Year	$26.24	$90.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$33.52	$46.63

(*)Special Calculation Note :

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Clark, Darke, Greene, Miami, Montgomery, Preble

Special Jurisdictional Note :

Details :

Industrial work but not limited to:work done on industrial plants, repair garages, processing plants,storage tanks, warehouses, skeleton structures,bridges,whether new or old construction, office buildings in industrial sites and interior of shopping malls.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 249 HevHwy

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Painter	5/21/2025	5/21/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Painter Bridge Blaster Class 1	$40.86		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$54.83	$75.26
Bridge Painter, Rigger, Containment Builder, Spot Blaster Class 2	$37.86		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$51.83	$70.76
Equipment Operator/ Field Mechanic, Grit Reclamation, Paint Mixer, Traffic Control, Boat Person, Driver Class 3	$35.86		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$49.83	$67.76
Concrete Sealing, Concrete Blasting/Power Washing/ Etc. Class 4	$33.86		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$47.83	$64.76
Quality Control/Quality Assurance, Trafiic safety, Competent Person Class 5	$33.86		$6.50	$7.14	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$47.83	$64.76
Apprentice	BHR	Percent										
30 day Probationary	$20.43	$50.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$27.71	$37.93
1st Year	$26.56	$65.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$33.84	$47.12
2nd Year	$26.56	$65.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$33.84	$47.12
3rd Year	$30.65	$75.02	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$37.93	$53.26
4th Year	$34.73	$85.00	$6.50	$0.45	$0.33	$0.00	$0.00	$0.00	$0.00	$0.00	$42.01	$59.38

(*)Special Calculation Note :

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Clark, Darke, Greene, Miami, Montgomery, Preble

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 639 Sign and Display

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Painter	6/18/2025	6/18/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Top Mechanic Class A	$27.53		$4.50	$0.00	$0.00	$0.00	$0.00	$1.45	$0.00	$0.00	$33.48	$47.25
Top Mechanic Class B	$27.53		$4.50	$0.75	$0.00	$0.53	$0.00	$1.45	$0.00	$0.00	$34.76	$48.53
Top Helper Class A	$22.33		$4.50	$0.00	$0.00	$0.00	$0.00	$1.20	$0.00	$0.00	$28.03	$39.20
Top Helper Class B	$22.33		$4.50	$0.75	$0.00	$0.43	$0.00	$1.20	$0.00	$0.00	$29.21	$40.38
Helper Class A	$17.19		$4.50	$0.00	$0.00	$0.00	$0.00	$0.90	$0.00	$0.00	$22.59	$31.19
Helper Class B	$17.19		$4.50	$0.75	$0.00	$0.30	$0.00	$0.90	$0.00	$0.00	$23.64	$32.24
New Hire (90 Days)	$15.75		$4.50	$0.00	$0.00	$0.00	$0.00	$0.55	$0.00	$0.00	$20.80	$28.68
Apprentice	BHR	Percent										

(*)Special Calculation Note :

Other: Sick, Personal & Holiday Pay Swing Stage Rate: Employees shall receive a differential of $1.50 per hour for all hours worked on scaffolds four sections or higher, including any boom lifts and swing stage scaffolds. In addition, the rigging and derigging of hanging/suspended swing stage systems and rappelling/bolson chair work of a single employee will qualify for $1.50 differential, will be paid to a single lead Top Mechanic or single lead Top Helper on any given swing stage job, even when it includes multiple running rigs on a single jobsite.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Cuyahoga, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Geauga, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lake, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

The work performed by employees covered by this rate shall include cleaning and refinishing of architectural metals using chemicals, solvents, coatings and hand-applied lacquer thinner, removing scratches from mirror finished metals, burnishing of bronze, statuary finishes on exterior and interior surfaces during the course of the restoration and maintenance of architectural metals, and other specialty metal finishing work, and the use of all tools required to perform such work, including but not limited to polishes, spray equipment and scaffolding. Class A: Less Than 1 Year of Service Class B: More Than 1 Year of Service Top Mechanic: Top Mechanic shall be responsible for ensuring the highest quality of workmanship by Helpers, and be highly competent and knowledgeable in the following areas: coatings, both solvent and waterborne, spraying ability, stainless steel, aluminum and bronze finishing, scaffolding and swing stage work. The Top Mechanic shall also be responsible for providing necessary training of employees in lower classifications and for directing all employees in his/her crew to perform their responsibilities in a productive and efficient manner. Top Helper: For existing Top Helpers at the time of this Agreement shall, in addition to performing the responsibilities of a Helper, be responsible and accountable for the setup, breakdown, safety and quality of the Company's product. Helper: A Helper shall be responsible for performing tasks in refinishing, compliance with safety procedures, setting up and breaking down job sites, setting up and breaking down scaffolding and swing stages, preparing surfaces for refinishing, including but not limited to masking and stripping, cleaning, oxidizing, polishing and scratch removal on various finishes.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 639 Zone 2 Sign

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Painter	5/28/2025	5/28/2025

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Painter Sign Journeyman Tech/Team Leader Class A	$26.56	$3.36	$0.21	$0.00	$0.00	$0.00	$0.72	$0.00	$0.00	$30.85	$44.13
Painter Sign Journeyman Tech/Team Leader Class B	$26.56	$3.36	$0.21	$0.00	$0.51	$0.00	$0.72	$0.00	$0.00	$31.36	$44.64
Painter Sign Journeyman Tech/Team Leader Class C	$26.56	$3.36	$0.21	$0.00	$1.02	$0.00	$0.72	$0.00	$0.00	$31.87	$45.15
Painter Sign Journeyman Tech/Team Leader Class D	$26.56	$3.36	$0.21	$0.00	$1.53	$0.00	$0.72	$0.00	$0.00	$32.38	$45.66
Sign Journeyman Class A	$26.27	$3.36	$0.21	$0.00	$0.00	$0.00	$0.71	$0.00	$0.00	$30.55	$43.69
Sign Journeyman Class B	$26.27	$3.36	$0.21	$0.00	$0.51	$0.00	$0.71	$0.00	$0.00	$31.06	$44.20
Sign Journeyman Class C	$26.27	$3.36	$0.21	$0.00	$1.01	$0.00	$0.71	$0.00	$0.00	$31.56	$44.70
Sign Journeyman Class D	$26.27	$3.36	$0.21	$0.00	$1.52	$0.00	$0.71	$0.00	$0.00	$32.07	$45.21
Tech Sign Fabrication/ Erector Class A	$20.67	$3.36	$0.21	$0.00	$0.00	$0.00	$0.56	$0.00	$0.00	$24.80	$35.14
Tech Sign Fabrication/ Erector Class B	$20.67	$3.36	$0.21	$0.00	$0.40	$0.00	$0.56	$0.00	$0.00	$25.20	$35.54

Tech Sign Fabrication/ Erector Class C	$20.67		$3.36	$0.21	$0.00	$0.80	$0.00	$0.56	$0.00	$0.00	$25.60	$35.94
Tech Sign Fabrication/ Erector Class D	$20.67		$3.36	$0.21	$0.00	$1.19	$0.00	$0.56	$0.00	$0.00	$25.99	$36.33
Apprentice	BHR	Percent										

(*)Special Calculation Note :

Other is for paid holidays.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Auglaize, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Greene, Hamilton, Hancock, Hardin, Henry, Highland, Holmes, Huron, Jackson, Knox, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Mercer, Miami, Montgomery, Morrow, Muskingum, Ottawa, Paulding, Perry, Pickaway, Pike, Preble, Putnam, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Trumbull, Tuscarawas, Union, Van Wert, Warren, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

Class A: less that 1 year. Class B: 1-3 years. Class C; 3-10 years. Class D: More than 10 years.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Plasterer Local 132 (Dayton)

Type of Rate: Commercial

Change #: LCN01-2025ib

Craft: Plasterer

Effective Date: 6/4/2025

Effective Date: 6/4/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Plasterer	$30.08		$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$50.25	$65.29
Apprentice	BHR	Percent										
1st 800 Hours	$21.06	$70.00	$8.40	$0.00	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$33.88	$44.40
2nd 800 Hours	$22.26	$74.00	$8.40	$0.00	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$35.08	$46.21
3rd 800 Hours	$23.46	$78.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$43.63	$55.36
4th 800 Hours	$24.67	$82.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$44.84	$57.17
5th 800 Hours	$25.87	$86.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$46.04	$58.97
6th 800 Hours	$27.07	$90.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$47.24	$60.78
7th 800 Hours	$28.28	$94.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$48.45	$62.58
8th 800 Hours	$29.48	$98.00	$8.40	$7.35	$0.70	$0.00	$3.65	$0.07	$0.00	$0.00	$49.65	$64.39

(*)Special Calculation Note :

OTHER: International Training Fund

Ratio :

1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Clinton, Darke, Greene, Miami, Montgomery, Preble, Shelby

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Plumber Pipefitter Local 162

Type of Rate: Commercial

Change #: LCN02-2025ib

Craft: Plumber Pipefitter

Effective Date: 6/11/2025

Effective Date: 6/11/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Plumber Pipefitter	$46.68		$12.30	$10.87	$1.03	$0.00	$3.35	$0.00	$0.00	$0.00	$74.23	$97.57
Apprentice	BHR	Percent										
1st Year	$23.67	$50.70	$12.30	$3.26	$0.57	$0.00	$0.00	$0.00	$0.00	$0.00	$39.80	$51.63
2nd Year	$25.96	$55.61	$12.30	$5.69	$0.62	$0.00	$0.00	$0.00	$0.00	$0.00	$44.57	$57.55
3rd Year	$28.24	$60.49	$12.30	$8.53	$0.66	$0.00	$0.00	$0.00	$0.00	$0.00	$49.73	$63.85
4th Year	$32.83	$70.33	$12.30	$10.63	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$56.52	$72.94
5th Year	$37.39	$80.09	$12.30	$10.87	$0.85	$0.00	$3.35	$0.00	$0.00	$0.00	$64.76	$83.45

(*)Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice 2 - 4 Journeymen to 2 Apprentices 5 - 7 Journeymen to 3 Apprentices 8 - 10 Journeymen to 4 Apprentices

Jurisdiction (* denotes special jurisdictional note) :

Champaign, Clark, Clinton, Darke, Fayette, Greene, Miami, Montgomery, Preble

Special Jurisdictional Note :

Details :

Wage rate covers: all plumbing, pipefitting, heating, refrigeration and air conditioning work.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Roofer Local 75

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2024ib	Roofer	12/24/2024	12/24/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Roofer	$28.73		$8.73	$10.78	$0.76	$0.00	$0.00	$1.80	$0.00	$0.00	$50.80	$65.17
Slate and Tile	$28.95		$8.73	$10.78	$0.76	$0.00	$0.00	$1.80	$0.00	$0.00	$51.02	$65.50
Apprentice	BHR	Percent										
1st Term 1200 hrs	$17.00	$59.17	$2.50	$2.50	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$22.76	$31.26
2nd Term 1200 hrs	$18.00	$62.65	$8.58	$3.32	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$30.66	$39.66
3rd Term 1200 hrs	$19.00	$66.13	$8.58	$4.20	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$32.54	$42.04
4thTerm 1200 hrs	$20.00	$69.61	$8.58	$5.07	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$34.41	$44.41
5th Term 1200 hrs	$21.00	$73.09	$8.58	$5.95	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$36.29	$46.79
Tradesman	$22.70	$79.01	$5.00	$3.58	$0.76	$0.00	$0.00	$0.00	$0.00	$0.00	$32.04	$43.39

(*)Special Calculation Note :

Other is for National Roofing Industry Pension Plan.

Ratio :

3 Journeymen to 2 Apprentices

Jurisdiction (* denotes special jurisdictional note) :

Allen, Auglaize, Clark, Clinton, Darke, Greene, Mercer, Miami, Montgomery, Preble, Shelby, Van Wert

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Sheet Metal Local 24 (Dayton)

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Sheet Metal Worker	6/11/2025	6/11/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Sheet Metal Worker	$35.62		$10.14	$15.60	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$62.53	$80.34
Apprentice	BHR	Percent										
1st Year (Probationary Period)	$21.37	$60.00	$9.48	$5.50	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$37.52	$48.21
2nd Year	$23.15	$65.00	$9.56	$6.77	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$40.65	$52.23
3rd Year	$26.72	$75.02	$9.73	$9.28	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$46.90	$60.26
4th Year	$30.28	$85.00	$9.90	$11.80	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$53.15	$68.29
5th Year	$32.06	$90.00	$9.98	$13.07	$1.17	$0.00	$0.00	$0.00	$0.00	$0.00	$56.28	$72.31

(*)Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice then, 1 Apprentice for every 2 Journeymen thereafter

Jurisdiction (* denotes special jurisdictional note) :

Allen, Auglaize, Butler, Champaign, Clark, Clinton, Darke, Greene, Hardin, Logan, Mercer, Miami, Montgomery, Preble, Shelby, Van Wert, Warren, Wyandot

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Sprinkler Fitter Local 669

Type of Rate: Commercial

Change #:
LCR01-2025ib

Craft:
Sprinkler Fitter

Effective Date:
8/6/2025

Effective Date:
8/6/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Sprinkler Fitter	$48.28		$12.40	$7.40	$0.54	$0.00	$7.74	$0.00	$0.00	$0.00	$76.36	$100.5
Apprentice	BHR	Percent										
CLASS 1	$24.14	$50.00	$9.03	$0.00	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$33.71	$45.78
CLASS 2	$27.04	$56.00	$9.03	$0.00	$0.54	$0.00	$0.00	$0.00	$0.00	$0.00	$36.61	$50.13
CLASS 3	$29.45	$61.00	$12.40	$7.40	$0.54	$0.00	$1.15	$0.00	$0.00	$0.00	$50.94	$65.66
CLASS 4	$31.38	$65.00	$12.40	$7.40	$0.54	$0.00	$1.15	$0.00	$0.00	$0.00	$52.87	$68.56
CLASS 5	$33.31	$69.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$55.05	$71.70
CLASS 6	$36.21	$75.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$57.95	$76.05
CLASS 7	$38.14	$79.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$59.88	$78.95
CLASS 8	$40.56	$84.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$62.30	$82.58
CLASS 9	$42.97	$89.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$64.71	$86.19
CLASS 10	$44.90	$93.00	$12.40	$7.40	$0.54	$0.00	$1.40	$0.00	$0.00	$0.00	$66.64	$89.09

(*)Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

Sprinkler Fitter work shall consist of the installation, dismantling, maintenance, repairs, adjustments, and corrections of all fire protection and fire control systems including the unloading, handling by hand, power equipment and installation of all piping or tubing, appurtenances and equipment pertaining thereto, including both overhead and underground water mains, fire hydrants and hydrant mains, standpipes and hose connections to sprinkler systems used in connection with sprinkler and alarm systems. Also all tanks and pumps connected thereto, also included shall be CO-2 and Cardox Systems, Dry Chemical Systems, Foam Systems and all other fire protection systems.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Truck Driver Locals 20,40,92,100,175,284,348,377,637,697,908,957 - Bldg & HevHwy Class 1

Type of Rate: Commercial

Change #:
LCN01-2025ib

Craft:
Truck Driver

Effective Date:
5/28/2025

Effective Date:
5/28/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Truck Driver CLASS 1	$34.26		$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$53.51	$70.64
Apprentice	BHR	Percent										
First 6 months	$27.41	$80.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$46.66	$60.36
7-12 months	$29.12	$85.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$48.37	$62.93
13-18 months	$30.83	$90.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$50.08	$65.50
19-24 months	$32.55	$95.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$51.80	$68.07
25-30 months	$34.26	$100.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$53.51	$70.64

(*)Special Calculation Note :

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

CLASS 1: Drivers on trucks, including but not limited to: 4-wheel service trucks; 4-wheel dump trucks; batch trucks; drivers on tandems; truck sweepers (not to include power sweepers and scrubbers) Drivers on tractor – trailer combinations including but not limited to the following: Semi-tractor trucks; pole trailers; ready-mix trucks; fuel trucks; all trucks five (5) axle and over; drivers on belly dumps; truck mechanics (when needed).

Prevailing Wage Rate
Skilled Crafts

Name of Union: Truck Driver Locals 20,40,92,100,175,284,348,377,637,697,908,957 - Bldg & HevHwy Class 2

Type of Rate: Commercial

Change #:	**Craft:**	**Effective Date:**	**Effective Date:**
LCN01-2025ib	Truck Driver	5/28/2025	5/28/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Truck Driver CLASS 2	$35.26		$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$54.51	$72.14
Apprentice	BHR	Percent										
First 6 months	$28.21	$80.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$47.46	$61.56
7-12 months	$29.97	$85.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$49.22	$64.21
13-18 months	$31.73	$90.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$50.98	$66.85
19-24 months	$33.50	$95.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$52.75	$69.50
25-30 months	$35.26	$100.00	$9.25	$9.60	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$54.51	$72.14

(*)Special Calculation Note :

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

Adams, Allen, Ashland, Ashtabula, Athens, Auglaize, Belmont, Brown, Butler, Carroll, Champaign, Clark, Clermont, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Delaware, Erie, Fairfield, Fayette, Franklin, Fulton, Gallia, Greene, Guernsey, Hamilton, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Knox, Lawrence, Licking, Logan, Lorain, Lucas, Madison, Mahoning, Marion, Medina, Meigs, Mercer, Miami, Monroe, Montgomery, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pickaway, Pike, Portage, Preble, Putnam, Richland, Ross, Sandusky, Scioto, Seneca, Shelby, Stark, Summit, Trumbull, Tuscarawas, Union, Van Wert, Vinton, Warren, Washington, Wayne, Williams, Wood, Wyandot

Special Jurisdictional Note :

Details :

CLASS 2: Drivers on articulated dump trucks; rigid-frame rock trucks; distributor trucks; low boys/drag driver on the construction site only and heavy duty equipment (irrespective of load carried) when used exclusively for transportation on the construction site only.

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under Owner's separate contracts.
5. Owner-furnished/Owner-installed (OFOI) products.
6. Contractor's use of site and premises.
7. Coordination with occupants.
8. Work restrictions.
9. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Section 017300 "Execution" for coordination of Owner-installed products.

1.2 DEFINITIONS

A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.3 PROJECT INFORMATION

A. Project Identification: Preble County Full Service Maintenance Facility .

1. Project Location: 234 Quaker Trace Rd. West Alexandria, Ohio 45381 .

B. Owner: Ohio Dept Of Transportation .

1. Owner's Representative: Ben Trick, Project Manager, 30 West Spring Street, 4th Floor, Columbus, OH 43215, 614-466-6290 .

C. Architect, MEP, and Civil Burgess & Niple/KZF Design JV .

1. Architect's Representative: Chad Kohler, Architectural Practice Leader, 700 Broadway, Cincinnati, OH 45202, 513-579-0042 .

D. Architect's Consultants: Architect has retained the following design professionals, who

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have prepared designated portions of the Contract Documents:

1. Structural Engineer : Schaefer .

    a. Structural Engineer's Representative: Howard Harris, Senior Project Engineer, 537 East Pete Rose Way, Suite 400 Cincinnati, Ohio 45202, 513-542-3300 .

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. A replacement of the Ohio Department of Transportation Full-service Maintenance Facility in Preble Co. Scope includes construction of the main facility which includes an administrative office, truck storage, and vehicular maintenance sections (Total Area 26,500 sf, Type IIB Construction) , as well as several out buildings and associated site elements, including cold storage (Total Area 10,000 sf, Type VB Construction), materials storage (Total Area 3,022 sf, Type VB Construction), salt storage (Total Area 9,600 sf, Type VB Construction), brine production, above ground fuel storage, and associated site improvements. Demolition of existing structures to be carried out after completion of new facility. Project also includes a new water main below the Quaker Trace Road right of way.

    Project to be carried out in the following two phases. Refer to Sheet SP-C.104 for more details.
    Phase 1 – New Maintenance Facility.
    Phases 2 & 3 – Demolition of Existing Facility and New Parking Lot, respectively.

    Additional Work indicated in the Contract Documents.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 PHASED CONSTRUCTION

A. Construct the Work in phases, with each phase substantially complete as indicated on Drawings .

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule, showing the sequence, commencement and completion dates , and move-out and -in dates of Owner's personnel for all phases of the Work.

1.6 OWNER-FURNISHED/OWNER-INSTALLED (OFOI) PRODUCTS

A. The Owner will furnish and install products indicated.

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B. Owner-Furnished/Owner-Installed (OFOI) Products:

1. Refer to drawings .

1.7 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits on Use of Site: Confine construction operations to Areas described in phasing schedule on drawings .
2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.8 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

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1.9 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

D. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Project site is not permitted.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

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D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings .
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

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SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other Work of the Contract.

C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 01: Masonry Wainscot.

1. Base Bid: <**Install insulated metal panel finish from grade to stack joint on office**

& maintenance building> as indicated on Drawings OM-A.201 & OM-A.202 . .

2. Alternate: Install masonry veneer from grade to stack joint on Office & Maintenance building as indicated on Drawings OM-A.313, OM-A.314, & OM-A.315 and as specified in Section <**042000**> "Unit Masonry."

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 012300 "Alternates" for products selected under an alternate.
2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements

indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution provides sustainable design characteristics that specified product provided for compliance with LEED requirements.
c. Requested substitution provides sustainable design characteristics that specified product provided for compliance with IgCC requirements.
d. Requested substitution provides sustainable design characteristics that specified product provided for compliance with ASHRAE 189.1 requirements.
e. Requested substitution provides sustainable design characteristics that specified product provided for compliance with Green Globes requirements.
f. Substitution request is fully documented and properly submitted.
g. Requested substitution will not adversely affect Contractor's construction schedule.
h. Requested substitution has received necessary approvals of authorities having jurisdiction.
i. Requested substitution is compatible with other portions of the Work.
j. Requested substitution has been coordinated with other portions of the Work.
k. Requested substitution provides specified warranty.
l. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience:

1. Architect will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

a. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1) Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional

responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

2) Requested substitution does not require extensive revisions to the Contract Documents.
3) Requested substitution is consistent with the Contract Documents and will produce indicated results.
4) Requested substitution provides sustainable design characteristics that specified product provided for compliance with LEED requirements.
5) Requested substitution provides sustainable design characteristics that specified product provided for compliance with IgCC requirements.
6) Requested substitution provides sustainable design characteristics that specified product provided for compliance with ASHRAE 189.1 requirements.
7) Requested substitution provides sustainable design characteristics that specified product provided for compliance with Green Globes requirements.
8) Substitution request is fully documented and properly submitted.
9) Requested substitution will not adversely affect Contractor's construction schedule.
10) Requested substitution has received necessary approvals of authorities having jurisdiction.
11) Requested substitution is compatible with other portions of the Work.
12) Requested substitution has been coordinated with other portions of the Work.
13) Requested substitution provides specified warranty.
14) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:

1. Document 004373 "Proposed Schedule of Values Form" for requirements for furnishing proposed schedule of values with bid.
2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.

1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Owner's name.

c. Owner's Project number.
d. Name of Architect.
e. Architect's Project number.
f. Contractor's name and address.
g. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:

a. Related Specification Section or division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.

1) Labor.
2) Materials.
3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

a. Differentiate between items stored on-site and items stored off-site.

6. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
7. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
8. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
9. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be

consistent with previous applications and payments, as certified by Architect and paid for by Owner.

B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of

mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Sustainable design action plans, including preliminary project materials cost data.
6. Schedule of unit prices.
7. Submittal schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
12. Initial progress report.
13. Report of preconstruction conference.
14. Certificates of insurance and insurance policies.
15. Performance and payment bonds.
16. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

    a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 017700 "Closeout Procedures."

2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Certification of completion of final punch list items.
3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
4. Updated final statement, accounting for final changes to the Contract Sum.
5. AIA Document G706.
6. AIA Document G706A.
7. AIA Document G707.
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Proof that taxes, fees, and similar obligations are paid.
12. Waivers and releases.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Web-based Project management software package.
6. Project meetings.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
4. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.2 DEFINITIONS

A. BIM: Building Information Modeling.

B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in

attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, in web-based Project software directory,and in prominent location in eachbuilt facility. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates

coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

    a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    f. Indicate required installation sequences.
    g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs,

including insulation, bracing, flanges, and support systems.
b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

a. Runs of vertical and horizontal conduit **1-1/4 inches** in diameter and larger.
b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:

a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format:

a. Same digital data software program, version, and operating system as original Drawings.

2. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format andPDF format.
3. BIM File Incorporation: Develop and incorporate coordination drawing files into BIM established for Project.

a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.

4. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.

a. Architect makes no representations as to the accuracy or completeness of

digital data files as they relate to Drawings.

b. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.

1.6 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Owner name.
3. Owner's Project number.
4. Name of Architect.
5. Architect's Project number.
6. Date.
7. Name of Contractor.
8. RFI number, numbered sequentially.
9. RFI subject.
10. Specification Section number and title and related paragraphs, as appropriate.
11. Drawing number and detail references, as appropriate.
12. Field dimensions and conditions, as appropriate.
13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
14. Contractor's signature.
15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of web-based Project management software. Software log with not less than the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number, including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model orCAD drawings will be provided by Architect for Contractor's use during construction.

1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD

2024 and Revit 2024.

4. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect.

    a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

B. Web-Based Project Management Software Package: Provide, administer, and use web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Web-based Project management software includes, at a minimum, the following features:

    a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
    b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
    c. Document workflow planning, allowing customization of workflow between project entities.
    d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
    e. Track status of each Project communication in real time, and log time and date when responses are provided.
    f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
    g. Processing and tracking of payment applications.
    h. Processing and tracking of contract modifications.
    i. Creating and distributing meeting minutes.
    j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
    k. Management of construction progress photographs.
    l. Mobile device compatibility, including smartphones and tablets.

2. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Autodesk, Inc.
    b. Corecon Technologies, Inc.
    c. Deltek Inc.
    d. Meridian Systems, Inc.
    e. Newforma, Inc.

f. Procore Technologies, Inc.
g. Viewpoint, Inc.; a Trimble Company.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.8 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Phasing.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.
g. Use of web-based Project software.
h. Procedures for processing field decisions and Change Orders.

i. Procedures for RFIs.
j. Procedures for testing and inspecting.
k. Procedures for processing Applications for Payment.
l. Distribution of the Contract Documents.
m. Submittal procedures.
n. Preparation of Record Documents.
o. Use of the premises and existing building.
p. Work restrictions.
q. Working hours.
r. Owner's occupancy requirements.
s. Responsibility for temporary facilities and controls.
t. Procedures for moisture and mold control.
u. Procedures for disruptions and shutdowns.
v. Construction waste management and recycling.
w. Parking availability.
x. Office, work, and storage areas.
y. Equipment deliveries and priorities.
z. First aid.
aa. Security.
bb. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Compatibility requirements.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written instructions.
n. Warranty requirements.
o. Compatibility of materials.

p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of Record Documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Procedures for completing and archiving web-based Project software site data files.
d. Submittal of written warranties.
e. Requirements for preparing operations and maintenance data.
f. Requirements for delivery of material samples, attic stock, and spare parts.
g. Requirements for demonstration and training.
h. Preparation of Contractor's punch list.
i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
j. Submittal procedures.
k. Coordination of separate contracts.
l. Owner's partial occupancy requirements.
m. Installation of Owner's furniture, fixtures, and equipment.
n. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at regular intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Resolution of BIM component conflicts.
        4) Status of submittals.
        5) Deliveries.
        6) Off-site fabrication.
        7) Access.
        8) Site use.
        9) Temporary facilities and controls.
        10) Progress cleaning.
        11) Quality and work standards.
        12) Status of correction of deficient items.
        13) Field observations.
        14) Status of RFIs.
        15) Status of Proposal Requests.
        16) Pending changes.
        17) Status of Change Orders.
        18) Pending claims and disputes.
        19) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site use.
9) Temporary facilities and controls.
10) Work hours.
11) Hazards and risks.
12) Progress cleaning.
13) Quality and work standards.
14) Status of RFIs.
15) Proposal Requests.
16) Change Orders.
17) Pending changes.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.9 PHOTOGRAPHIC DOCUMENTATION

A. Multi-Vista shall provide photographic documentation during and at the end of construction under the A/E's contract. Contact Tim Brunney (614-387-1190) of ODOT for further information.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's Construction Schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Unusual event reports.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
2. Section 014000 "Quality Requirements" for schedule of tests and inspections.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.
2. PDF file.

B. Startup construction schedule.

1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports to contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at weekly intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

H. Unusual Event Reports: Submit at time of unusual event.

I. Qualification Data: For scheduling consultant.

1.4 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing interim milestones partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review submittal requirements and procedures.
7. Review time required for review of submittals and resubmittals.
8. Review requirements for tests and inspections by independent testing and inspecting agencies.
9. Review time required for Project closeout and Owner startup procedures.
10. Review and finalize list of construction activities to be included in schedule.
11. Review procedures for updating schedule.

1.5 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Computer Scheduling Software: Prepare schedules using current version of a program that is capable of managing construction schedules.

1. Use scheduling component of Project management software package specified in Section 013100 "Project Management and Coordination," for current Windows operating system.

B. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.

1. Contract completion date to not be changed by submission of a schedule that

shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Temporary Facilities: Indicate start and completion dates for the following as applicable:

    a. Securing of approvals and permits required for performance of the Work.
    b. Temporary facilities.
    c. Construction of mock-ups, prototypes and samples.
    d. Owner interfaces and furnishing of items.
    e. Interfaces with Separate Contracts.
    f. Regulatory agency approvals.
    g. Punch list.

3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
4. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
6. Commissioning Time: Include no fewer than 15 days for commissioning.
7. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
8. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
4. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use-of-premises restrictions.

f. Seasonal variations.
g. Environmental control.

5. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. Structural completion.
b. Temporary enclosure and space conditioning.
c. Permanent space enclosure.
d. Completion of mechanical installation.
e. Completion of electrical installation.
f. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion, and the following interim milestones:

1. Temporary enclosure and space conditioning.
2. Phasing milestones.

F. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.

1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.

G. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and the Contract Time.

H. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Final Completion percentage for each activity.

I. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

J. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.7 CPM SCHEDULE REQUIREMENTS

A. Prepare network diagrams using AON (activity-on-node) format.

B. Startup Network Diagram: Submit diagram within 14 days of date established for commencement of the Work. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 60 days after date established for commencement of the Work.

a. Failure to include any work item required for performance of this Contract must not excuse Contractor from completing all work within applicable completion dates.

2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.
    i. Testing and inspection.
    j. Commissioning.
    k. Punch list and Final Completion.
    l. Activities occurring following Final Completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates to be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

    a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.

11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

C. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within two day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
8. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates.

Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal Category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled date of fabrication.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.

15. Remarks.
16. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

E. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise

Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

a. Wiring diagrams that show factory-installed wiring.
b. Printed performance curves.

c. Operational range diagrams.
d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.
f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
4. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
5. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition

at time of use.

b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

7. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.

   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

8. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

   a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.

      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable.

Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

a. Name of evaluation organization.
b. Date of evaluation.
c. Time period when report is in effect.
d. Product and manufacturers' names.
e. Description of product.
f. Test procedures and results.
g. Limitations of use.

1.7 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required.

1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action.
2. Submittals by Web-Based Project Management Software: Architect will indicate, on Project management software website, the appropriate action.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will discard submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

1. Mockups are used for one or more of the following:

a. Verify selections made under Sample submittals.
b. Demonstrate aesthetic effects.

c. Demonstrate the qualities of products and workmanship.
d. Demonstrate successful installation of interfaces between components and systems.
e. Perform preconstruction testing to determine system performance.

2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 DELEGATED DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the

products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.

7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.

B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by Commissioning Authority.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.

3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor's Responsibilities:

    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    d. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
    e. When testing is complete, remove test specimens and test assemblies; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Notify Architectseven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically

approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

1.9 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Payment for these services will be made from testing and inspection allowances , as authorized by Change Orders.
3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform quality-control services.

    a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed

in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspection equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.

1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections:Engage a qualified testing agency orspecial inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect'sand authorities' having jurisdiction reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms, including "requested," "authorized," "selected," "required," and "permitted," have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms, including "shown," "noted," "scheduled," and "specified," have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

B. Industry Organizations, List: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; (see FGIA).
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; www.concrete.org.
9. ACP - American Clean Power; (Formerly: American Wind Energy Association); www.cleanpower.org.
10. ACPA - American Concrete Pipe Association; www.concretepipe.org.
11. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
12. AF&PA - American Forest & Paper Association; www.afandpa.org.
13. AGA - American Gas Association; www.aga.org.
14. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
15. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
16. AI - Asphalt Institute; www.asphaltinstitute.org.
17. AIA - American Institute of Architects (The); www.aia.org.
18. AISC - American Institute of Steel Construction; www.aisc.org.
19. AISI - American Iron and Steel Institute; www.steel.org.
20. AITC - American Institute of Timber Construction; (see PLIB).
21. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
22. AMPP - Association for Materials Protection and Performance; www.ampp.org.
23. ANSI - American National Standards Institute; www.ansi.org.
24. AOSA/SCST - Association of Official Seed Analysts (The)/Society of Commercial Seed Technologists (The); www.analyzeseeds.com.
25. APA - APA - The Engineered Wood Association; www.apawood.org.
26. APA - Architectural Precast Association; www.archprecast.org.

27. API - American Petroleum Institute; www.api.org.
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASA - Acoustical Society of America; www.acousticalsociety.org.
30. ASCE - American Society of Civil Engineers; www.asce.org.
31. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (see ASCE).
32. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
33. ASME - ASME International; ; www.asme.org.
34. ASSE - ASSE International; (American Society of Sanitary Engineering); www.asse-plumbing.org.
35. ASSP - American Society of Safety Professionals; www.assp.org.
36. ASTM - ASTM International; www.astm.org.
37. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
38. AVIXA - Audiovisual and Integrated Experience Association; www.avixa.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWPA - American Wood Protection Association; www.awpa.com.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.
46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - Business and Institutional Furniture Manufacturer's Association; www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BSI - British Standards Institution; www.bsigroup.com.
50. BWF - Badminton World Federation; www.bwfbadminton.com.
51. CARB - California Air Resources Board; www.arb.ca.gov.
52. CDA - Copper Development Association Inc.; www.copper.org.
53. CE - Conformite Europeenne (European Commission); www.ec.europa.eu/growth/single-market/ce-marking.
54. CEA - Canadian Electricity Association; www.electricity.ca.
55. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
56. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
57. CGA - Compressed Gas Association; www.cganet.com.
58. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
59. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
60. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
61. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
62. CMHA - Concrete Masonry & Hardscape Association; (Formerly: National Concrete Masonry Association); www.masonryandhardscapes.org.
63. CPA - Composite Panel Association; www.compositepanel.org.
64. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
65. CRRC - Cool Roof Rating Council; www.coolroofs.org.
66. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
67. CSA - CSA Group; www.csagroup.org.
68. CSI - Cast Stone Institute; www.caststone.org.

69. CSI - Construction Specifications Institute (The); www.csiresources.org.
70. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
71. CTA - Consumer Technology Association; www.cta.tech.
72. CTI - Cooling Technology Institute; www.coolingtechnology.org.
73. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
74. DHA - Decorative Hardwoods Association; www.decorativehardwoods.org.
75. DHI - Door and Hardware Institute; www.dhi.org.
76. ECIA - Electronic Components Industry Association; www.ecianow.org.
77. EIMA - EIFS Industry Members Association; www.eima.com.
78. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
79. EOS/ESD - EOS/ESD Association, Inc.; Electrostatic Discharge Association; www.esda.org.
80. ESTA - Entertainment Services and Technology Association; www.esta.org.
81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
83. FGIA - Fenestration and Glazing Industry Alliance; https://fgiaonline.org.
84. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
85. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
86. FM Approvals - FM Approvals LLC; www.fmapprovals.com.
87. FM Global - FM Global; www.fmglobal.com.
88. FRSA - Florida Roofing and Sheet Metal Contractors Association, Inc.; www.floridaroof.com.
89. FSA - Fluid Sealing Association; www.fluidsealing.com.
90. FSC - Forest Stewardship Council U.S.; www.fscus.org.
91. GA - Gypsum Association; www.gypsum.org.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HMMA - Hollow Metal Manufacturers Association; (see NAAMM).
95. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
96. IAS - International Accreditation Service; www.iasonline.org.
97. ICC - International Code Council; www.iccsafe.org.
98. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
99. ICPA - International Cast Polymer Association (The); www.theicpa.com.
100. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
101. IEC - International Electrotechnical Commission; www.iec.ch.
102. IEEE SA - IEEE Standards Association; https://standards.ieee.org.
103. IES - Illuminating Engineering Society; www.ies.org.
104. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
105. IGMA - Insulating Glass Manufacturers Alliance; (see FGIA).
106. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
107. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
108. Intertek - Intertek Group; www.intertek.com.
109. ISA - International Society of Automation (The); www.isa.org.
110. ISFA - International Surface Fabricators Association; www.isfanow.org.
111. ISO - International Organization for Standardization; www.iso.org.
112. ITU - International Telecommunication Union; www.itu.int.
113. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.

114. LPI - Lightning Protection Institute; www.lightning.org.
115. MBMA - Metal Building Manufacturers Association; www.mbma.com.
116. MCA - Metal Construction Association; www.metalconstruction.org.
117. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
118. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
119. MHI - Material Handling Industry; www.mhi.org.
120. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
121. MPI - Master Painters Institute; www.paintinfo.com.
122. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.; www.msshq.org.
123. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
124. NACE - NACE International; (National Association of Corrosion Engineers International); (see AMPP).
125. NADCA - National Air Duct Cleaners Association; www.nadca.com.
126. NAIMA - North American Insulation Manufacturers Association; www.insulationinstitute.org.
127. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
128. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
129. NBI - New Buildings Institute; www.newbuildings.org.
130. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
131. NCMA - National Concrete Masonry Association; (see CMHA).
132. NEBB - National Environmental Balancing Bureau; www.nebb.org.
133. NECA - National Electrical Contractors Association; www.necanet.org.
134. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
135. NEMA - National Electrical Manufacturers Association; www.nema.org.
136. NETA - InterNational Electrical Testing Association; www.netaworld.org.
137. NFHS - National Federation of State High School Associations; www.nfhs.org.
138. NFPA - National Fire Protection Association; www.nfpa.org.
139. NFPA - NFPA International; (see NFPA).
140. NFRC - National Fenestration Rating Council; www.nfrc.org.
141. NGA - National Glass Association; www.glass.org.
142. NHLA - National Hardwood Lumber Association; www.nhla.com.
143. NLGA - National Lumber Grades Authority; www.nlga.org.
144. NOFMA - National Oak Flooring Manufacturers Association; (see NWFA).
145. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
146. NRCA - National Roofing Contractors Association; www.nrca.net.
147. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
148. NSF - NSF International; www.nsf.org.
149. NSI - Natural Stone Institute; www.naturalstoneinstitute.org.
150. NSPE - National Society of Professional Engineers; www.nspe.org.
151. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
152. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
153. NWFA - National Wood Flooring Association; www.nwfa.org.
154. NWRA - National Waste & Recycling Association; www.wasterecycling.org.
155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; www.plasa.org.

158. PLIB - Pacific Lumber Inspection Bureau; www.plib.org.
159. PVCPA - Uni-Bell PVC Pipe Association; www.uni-bell.org.
160. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
161. RFCI - Resilient Floor Covering Institute; www.rfci.com.
162. RIS - Redwood Inspection Service; (see WWPA).
163. SAE - SAE International; www.sae.org.
164. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
165. SDI - Steel Deck Institute; www.sdi.org.
166. SDI - Steel Door Institute; www.steeldoor.org.
167. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
168. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (see ASCE).
169. SIA - Security Industry Association; www.securityindustry.org.
170. SJI - Steel Joist Institute; www.steeljoist.org.
171. SMA - Screen Manufacturers Association; www.smainfo.org.
172. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
173. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
174. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
175. SPIB - Southern Pine Inspection Bureau; www.spib.org.
176. SPRI - Single Ply Roofing Industry; www.spri.org.
177. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
178. SSINA - Specialty Steel Industry of North America; www.ssina.com.
179. SSPC - SSPC: The Society for Protective Coatings; (see AMPP).
180. STI/SPFA - Steel Tank Institute/Steel Plate Fabricators Association; www.steeltank.com.
181. SWI - Steel Window Institute; www.steelwindows.com.
182. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
183. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
184. TCNA - Tile Council of North America, Inc.; www.tcnatile.com.
185. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.kbcdco.tema.org.
186. TIA - Telecommunications Industry Association; www.tiaonline.org.
187. TMS - The Masonry Society; www.masonrysociety.org.
188. TPI - Truss Plate Institute; www.tpinst.org.
189. TPI - Turfgrass Producers International; www.turfgrasssod.org.
190. TRI - Tile Roofing Industry Alliance; www.tileroofing.org.
191. ULSE - UL Standards & Engagement Inc.; www.ulse.org.
192. UL - UL Solutions Inc.; www.ul.com.
193. USAV - USA Volleyball; www.usavolleyball.org.
194. USGBC - U.S. Green Building Council; www.usgbc.org.
195. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
196. WA - Wallcoverings Association; www.wallcoverings.org.
197. WCLIB - West Coast Lumber Inspection Bureau; (see PLIB).
198. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
199. WDMA - Window & Door Manufacturers Association; www.wdma.com.
200. WI - Woodwork Institute; www.woodworkinstitute.com.
201. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
202. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
2. ICC - International Code Council; www.iccsafe.org.
3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. CPSC - U.S. Consumer Product Safety Commission; www.cpsc.gov.
2. DOC - U.S. Department of Commerce; www.commerce.gov.
3. DOD - U.S. Department of Defense; www.defense.gov.
4. DOE - U.S. Department of Energy; www.energy.gov.
5. DOJ - U.S. Department of Justice; www.ojp.usdoj.gov
6. DOS - U.S. Department of State; www.state.gov.
7. EPA - United States Environmental Protection Agency; www.epa.gov.
8. FAA - Federal Aviation Administration; www.faa.gov.
9. GPO - U.S. Government Publishing Office; www.gpo.gov.
10. GSA - U.S. General Services Administration; www.gsa.gov.
11. HUD - U.S. Department of Housing and Urban Development; www.hud.gov.
12. LBNL - Lawrence Berkeley National Laboratory; Energy Technologies Area; www.lbl.gov/.
13. NIST - National Institute of Standards and Technology; www.nist.gov.
14. OSHA - Occupational Safety & Health Administration; www.osha.gov.
15. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
16. USACE - U.S. Army Corps of Engineers; www.usace.army.mil.
17. USDA - U.S. Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
18. USDA - U.S. Department of Agriculture; Rural Utilities Service; www.usda.gov.
19. USP - U.S. Pharmacopeial Convention; www.usp.org.
20. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from U.S. Government Publishing Office; www.govinfo.gov.
2. DOD - U.S. Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.dsp.dla.mil/Specs-Standards/.
3. DSCC - Defense Supply Center Columbus; (see FS).
4. FED-STD - Federal Standard; (see FS).
5. FS - Federal Specification; Available from DLA Document Services;

www.dsp.dla.mil/Specs-Standards/.

a. Available from Defense Standardization Program; www.dsp.dla.mil.
b. Available from U.S. General Services Administration; www.gsa.gov.
c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.

6. MILSPEC - Military Specifications and Standards; (see DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (see USAB).

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 43 39 - MOCKUPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Integrated exterior mockups.

B. Related Requirements:

1. Section 014000 "Quality Requirements" for quality assurance requirements for aesthetic and workmanship mockups specified in other Sections.

1.2 DEFINITIONS

A. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, testing and inspecting agency representative, and installers of major systems whose Work is included in mockups.
2. Review locations and extent of mockups.
3. Review and finalize schedule for mockups, and verify availability of materials, personnel, equipment, and facilities needed to complete mockups and maintain schedule for the Work.

1.4 ACTION SUBMITTALS

A. Shop Drawings: For mockups.

1. Include plans, elevations, sections, and details.
2. Indicate manufacturer and model number of individual components, subassemblies, and assemblies.
3. Include site location drawing indicating orientation of mockup.
4. Revise and resubmit Shop Drawings to reflect approved modifications in details and component interfaces resulting from changes made during testing procedures.

B. Delegated Design Submittal: For temporary structural supports for mockups not attached to building structure, including analysis data signed and sealed by the

qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Build mockups to do the following:

1. Verify selections made under Sample submittals.
2. Demonstrate aesthetic effects.
3. Demonstrate the qualities of products and workmanship.
4. Demonstrate acceptable coordination between components and systems.

B. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work.

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed unless otherwise indicated.

C. Notifications:

1. Notify Architectseven days in advance of the dates and times when mockups will be constructed.
2. Allow seven days for initial review and each re-review of each mockup.

D. Approval: Obtain Architect's approval of mockups before starting fabrication or construction of corresponding Work.

1. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.6 COORDINATION

A. Coordinate schedule for construction of mockups, so construction, testing, and review of mockups do not impact Project schedule.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design support structure for free-standing mockups.

B. Structural Performance:

1. Wind Loads: As indicated on Drawings.

PART 3 - EXECUTION

END OF SECTION 01 43 39

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

C. This Section is not intended to limit types and amounts of temporary construction facilities and controls required. Omission from this Section will not be accepted as an application that such temporary activity is not required for successful completion of the work and compliance with requirements of the Contract Documents.

D. Any Contractor requiring one of the temporary services before it can be provided as specified, or whose requirements with respect to a particular service differ from the service specified, shall provide such service as suits his needs, at his own expense and in a manner satisfactory to the A/E.

1.2 USE CHARGES

A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.

C. Water Service: Pay water-service use charges for water used by all entities for construction operations.

D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

E. The Contractor will provide and pay for the following temporary facilities (including, but not limited to the following):

1. Telephone service
2. Temporary roads and paving
3. Sanitary facilities, including drinking water
4. Dewatering facilities and drains
5. Temporary enclosures

6. Temporary Project identification signs
7. Waste disposal services
8. Rodent and pest control
9. Construction aids
10. Temporary fire protection
11. Barricades, warning signs, lights
12. Environmental protection
13. Water service and distribution
14. Installation of temporary electric power and light. Provide connections and extensions of services as required for construction operations

1.3 WEATHER PROTECTION

A. It is the intent of these Specifications to have the Contractor protect all work and existing or adjacent property against weather, to maintain the work, materials, apparatus and fixtures free from injury or damage in accordance with the General Conditions during the entire construction period. Work likely to be damaged shall be covered or protected at the end of each day's work. Any work damaged by failure to provide protection required, shall be removed and re- placed with new work at the Contractor's expense.

B. Contractor

1. Remove all snow and ice as may be required for proper protection and execution of the work and protection and safety of the public.
2. Provide winter weather closures at all unclosed openings.

C. Mud and Water Control: Water shall not be permitted to accumulate on the site or adjacent areas. All personnel and vehicle accesses shall be stoned and continually maintained free of mud, dirt and debris. During construction, grades in and adjacent to the project site shall be maintained to facilitate positive drainage. All trenching and excavation work shall be maintained fee of standing water. Sanitary sewer lines or manholes shall not be used for water disposal.

1.4 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities

having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
3. Indicate methods to be used to avoid trapping water in finished work.

F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste-handling procedures.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Comply with industry standards and applicable law as and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and Safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.

B. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

D. Accessible Temporary Egress: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum **2-inch**, **0.148-inch-** thick, galvanized-steel, chain-link fabric fencing; minimum **6 feet** high with galvanized-steel pipe posts; minimum **2-3/8-inch-** OD line posts and **2-7/8-inch-** OD corner and pull posts, with 1-5/8-inch- OD top rails.

B. Portable Chain-Link Fencing: Minimum **2-inch**, **0.148-inch-** thick, galvanized-steel, chain-link fabric fencing; minimum **6 feet** high with galvanized-steel pipe posts; minimum **2-3/8-inch-** OD line posts and **2-7/8-inch-** OD corner and pull posts, with **1-5/8-inch-** OD top and bottom rails. Provide concrete orgalvanized-steel bases for supporting posts.

C. Polyethylene Sheet: Reinforced, fire-resistive sheet, **10-mil** minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.

D. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum **36 by 60 inches**.

E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices:

1. Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer

than one receptacle on each wall. Furnish room with conference table, chairs, and **4-foot-** square tack and marker boards.

3. Provide office space for 1 person from ODOT Facilities Office and one person from the project design team with sufficient furniture for 2 persons to use simultaneously. Provide at least one telephone handset to be used in this office.
4. Drinking water and private toilet.
5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of **68 to 72 deg F**.
6. Lighting fixtures capable of maintaining average illumination of **20 fc** at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

D. Other temporary facilities and controls in the Contract include, but are not limited to the following:

1. Temporary Sediment and erosion control.
2. Temporary drainage, including drainage ditches, dry wells, stabilization ponds, and containers.
3. Storm water control.
4. Temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
5. Temporary enclosure for building exterior, except as indicated.
6. Temporary roads and paved areas.
7. Dewatering facilities and drains.
8. Excavation support and protection, unless required solely for the Work of another contract.
9. Special or unusual hoisting requirements for construction activities, including hoisting loads in excess of 2 tons (2000 kg), hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
10. Project identification and temporary signs.
11. General waste disposal facilities.
12. Pest control.
13. Temporary fire-protection equipment.
14. Barricades, warning signs, and lights.
15. Site enclosure fence.
16. Security enclosure and lockup.
17. Environmental protection.
18. Keep State and/or County access roads at the project site clean of mud, construction debris and other items related to this project. Problems that occur are to be addressed immediately upon notification by State of Ohio or local officials.
19. Piped gas service.
20. Electric power service and distribution.
21. Data/Communication service and distribution.
22. Lighting, including site lighting.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide exterior located Indirect Hydronic Heating system with heat exchangers that distribute heat inside the facility.

1. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
2. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required.

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service:

1. Install water service and distribution piping in sizes and pressures adequate for construction.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities is not permitted.

E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

F. Electric Power Service:

1. Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

a. Install electric power service overhead unless otherwise indicated.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one land-based telephone line(s) for each field office.

1. Provide additional telephone lines for the following:

a. Provide one telephone line(s) for Owner's use.

2. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Architect's office.
f. .

g. Engineers' offices.
h. Owner's office.
i. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

I. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.

1. Provide high speed access to the construction trailer via a cable modem or T1 line.
2. Provide high speed data access that is compatible with ODOT standards for the use of its field administrator.

3.3 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within **30 feet** of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 312000 "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 321216 "Asphalt Paving."

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Provide temporary parking areas for construction personnel.

F. Storage and Staging: Provide temporary area for storage and staging needs.

G. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

H. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touch up signs, so they are legible at all times.

I. Waste Disposal Facilities:

1. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct

construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Temporary Erosion and Sedimentation Control:

1. Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
2. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, in accordance with erosion- and sedimentation-control Drawings andrequirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

    a. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
    b. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
    c. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
    d. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection:

1. Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As indicated on Drawings.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

H. Security Enclosure and Lockup: Install temporary enclosure around partially completed

areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

J. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

    a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
    b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Maintenance personnel necessary to perform this work shall be provided in accordance with the requirements. Maintenance time will include normal working hours for all trades and start up and shut down overtime as required.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 57 23 - TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Temporary stormwater pollution controls.

1.2 STORMWATER POLLUTION PREVENTION PLAN

A. The Stormwater Pollution Prevention Plan (SWPPP) is part of the Contract Documents and is bound into this Project Manual.

1.3 INFORMATIONAL SUBMITTALS

A. Stormwater Pollution Prevention Plan (SWPP): Within 15 days of date established for commencement of the Work, submit completed SWPPP.

B. EPA authorization under the EPA's "2017 Construction General Permit (CGP)."

C. Stormwater Pollution Prevention (SWPP) Training Log: For each individual performing Work under the SWPPP.

D. Inspection reports.

1.4 QUALITY ASSURANCE

A. Stormwater Pollution Prevention Plan (SWPPP) Coordinator: Experienced individual or firm with a record of successful water pollution control management coordination of projects with similar requirements.

1. SWPPP Coordinator shall complete and finalize the SWPPP form.
2. SWPPP Coordinator shall be responsible for inspections and maintaining of all requirements of the SWPPP.

B. Installers: Trained as indicated in the SWPPP.

PART 2 - PRODUCTS

2.1 TEMPORARY STORMWATER POLLUTION CONTROLS

A. Provide temporary stormwater pollution controls as required by the SWPPP.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with all best management practices, general requirements, performance requirements, reporting requirements, and all other requirements included in the SWPPP.

B. Locate stormwater pollution controls in accordance with the SWPPP.

C. Conduct construction as required to comply with the SWPPP and that minimize possible contamination or pollution or other undesirable effects.

1. Inspect, repair, and maintain SWPPP controls during construction.

a. Inspect all SWPPP controls not less than every seven days, and after each occurrence of a storm event, as outlined in the SWPPP.

D. Remove SWPPP controls at completion of construction and restore and stabilize areas disturbed during construction.

END OF SECTION 01 57 23

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of This Section Includes: Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
2. Section 012300 "Alternates" for products selected under an alternate.
3. Section 012500 "Substitution Procedures" for requests for substitutions.
4. Section 014200 "References" for applicable industry standards for products specified.
5. Section 017700 "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products unless otherwise indicated.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluating Comparable Products: In addition to the basis-of-design product

description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.

1.3 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Resolution of Compatibility Disputes between Multiple Contractors:

a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products will be used.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is inconspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:

    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.
    d. Speed.
    e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.4 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
2. Store products to allow for inspection and measurement of quantity or counting of units.
3. Store materials in a manner that will not endanger Project structure.
4. Store products that are subject to damage by the elements under cover in a

weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections are to be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been

produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

    a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by Architect, whose determination is final.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.

    a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

    a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
    b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.

5. Limited List of Manufacturers: Where Specifications include a list of

manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.

a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.

a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests

without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation as specified in section 013300 "Submittal Procedures."

1. Architect's Approval of Submittal: As specified in section 013300 "Submittal Procedures.".
2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering.
3. Installation.
4. Cutting and patching.
5. Coordination of Owner's portion of the Work.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Requirements:

1. Section 011000 "Summary" for coordination of Owner-furnished products , Owner-performed work, and limits on use of Project site.
2. Section 013300 "Submittal Procedures" for submitting surveys.
3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
4. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 PREINSTALLATION MEETINGS

A. Layout Conference: Conduct conference at Project site.

1. Prior to establishing layout of new perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:

a. Contractor's superintendent.
b. Professional surveyor responsible for performing Project surveying and layout.

2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other

submittals.

4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.

B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard

established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb, and make horizontal work level.
2. Where space is limited, install components to maximize space available for

maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel.

1. Refer to Section 011000 "Summary" for other requirements for Owner-furnished,

Contractor-installed and Owner-furnished, Owner-installed products.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above **80 deg F**.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." Section 017419 "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass, reflective surfaces and other damaged transparent materials. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

1. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

G. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

H. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes administrative and procedural requirements for the following:

1. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

A. CMU: Concrete masonry units.

B. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

C. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

D. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.

E. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

F. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

G. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications:

1. Universal, certified by EPA-approved certification program.
2. Comply with requirements in Section 024116 "Structure Demolition."

B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
2. Review and finalize procedures for materials separation, and verify availability of containers and bins needed to avoid delays.
3. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
4. Review waste management requirements for each trade.

PART 2 - PRODUCTS
PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 DISPOSAL OF WASTE

A. Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Unless otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning:

1. Do not burn waste materials.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final Completion procedures.
3. List of incomplete items.
4. Submittal of Project warranties.
5. Final cleaning.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Section 017900 "Demonstration and Training" for requirements to train Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest-control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit testing, adjusting, and balancing records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List

items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:

1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final

inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first, listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.

4. Submit list of incomplete items in the following format:

    a. MS Excel Electronic File: Architect will return annotated file.
    b. PDF Electronic File: Architect will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

1. Submit on digital media acceptable to Architect.

E. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive **8-1/2-by-11-inch** paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and

other foreign deposits.

c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
i. Vacuum and mop concrete.
j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
l. Remove labels that are not permanent.
m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

    1) Clean HVAC system in compliance with NADCA ACR. Standard 1992-01. Provide written report on completion of cleaning.

q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
r. Clean strainers.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 CORRECTION OF THE WORK

A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory manuals.
2. Emergency manuals.
3. Systems and equipment operation manuals.
4. Systems and equipment maintenance manuals.
5. Product maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual to contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation in accordance with ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.6 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:

1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.7 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.

8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system,

include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

    a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts,

with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:

1. Section 017300 "Execution" for final property survey.
2. Section 017700 "Closeout Procedures" for general closeout procedures.
3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up record prints.
2. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and .
2) Submit Record Digital Data Files and
3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit PDF electronic files of scanned Record Prints and three set(s) of file prints.
2) Print each drawing, whether or not changes and additional information were recorded.

c. Final Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Submit Record Digital Data Files and three set(s) of Record Digital Data File plots.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

E. Reports: Submit written report weeklyindicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.3 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.
e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.

h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.
2. Format: DWG, Version <**Insert designation**>, Microsoft Windows operating system.
3. Format: Annotated PDF electronic file.
4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
5. Refer instances of uncertainty to Architect for resolution.
6. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
b. Architect will provide data file layer information. Record markups in separate layers.

C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

1.4 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders and Record Drawings where applicable.

B. Format: Submit record specifications as annotated PDF electronic file scanned PDF electronic file(s) of marked-up paper copy of Specifications.

1.5 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

C. Format: Submit Record Product Data as annotated PDF electronic file.

1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.6 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.7 MAINTENANCE OF RECORD DOCUMENTS

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Instruction, training, and demonstration in operation and maintenance of systems, subsystems, and equipment.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For facilitator instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Contractor.

e. Date of video recording.

2. At completion of training, submit complete training manual(s) for Owner's use prepared in same format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Systems and equipment operation manuals.
    c. Systems and equipment maintenance manuals.
    d. Product maintenance manuals.
    e. Project Record Documents.
    f. Identification systems.
    g. Warranties and bonds.
    h. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

    a. Instructions on meaning of warnings, trouble indications, and error messages.
    b. Instructions on stopping.
    c. Shutdown instructions for each type of emergency.
    d. Operating instructions for conditions outside of normal operating limits.
    e. Sequences for electric or electronic systems.
    f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Control sequences.
    f. Safety procedures.
    g. Instructions on stopping.
    h. Normal shutdown instructions.
    i. Operating procedures for emergencies.
    j. Operating procedures for system, subsystem, or equipment failure.

k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning.
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

1.7 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

1.8 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and

maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least 30 days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a written performance-based test.

F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General:Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice. Demonstrations must be scheduled with the ODOT District to occur over a period of three consecutive days.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Systems for Demonstration and Training:

1. Brine System (Maker, Transfer pump, piping, building, etc.)
2. Calcium System
3. Entry Gates
4. Decanting Catch Basin Maintenance
5. Gas Detection System
6. Electrical Systems and Controls for all Buildings and Site (Fire Alarm, power, data, lighting, etc.)
7. Generator
8. Vehicle Lifts
9. Cranes (Bridge, Jib, Monorail, etc.)
10. Vehicle Exhaust Reels
11. Welding Exhaust
12. Fire Protection System(s) and controls
13. Tension Fabric maintenance
14. Wash Bay Equipment

15. HVAC Systems and Controls (radiant heaters, makeup air units, exhaust fans, etc.)
16. Fuel Island Equipment
17. Oil Room – Storage tanks, reels, and piping
18. Plumbing Systems (Wet (heater, fixtures, etc.), Air (drops, compressor, etc.), and Gas)
19. Overhead Doors
20. Shut off Valves – Detention and fuel island
21. S2 Access Control, Milestone CCTV, and DMP Intrusion

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 01 79 00

SECTION 02 41 16 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. Demolition and removal of buildings or structures.
2. Demolition and removal of site improvements.

B. Related Requirements:

1. Section 011000 "Summary" for use of the premises and phasing requirements.
2. Section 013200 "Construction Progress Documentation" for preconstruction photographs taken before building demolition.
3. Section 024119 "Selective Demolition" for partial demolition of buildings, structures, and site improvements.
4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade site improvements that are not part of building demolition.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner as indicated. Include fasteners or brackets needed for reattachment elsewhere.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be demolished.
2. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize protection requirements.
4. Review procedures for noise control and dust control.
5. Review procedures for protection of adjacent buildings.
6. Review storage, protection, and accounting for items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For refrigerant recovery technician.

B. Survey of Existing Conditions: Submit survey.

C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection , for dust control and , for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

D. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services. Indicate how long services will be interrupted.
3. Coordination for shutoff and capping or re-routing of utility services.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed in accordance with EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Universal certified by an EPA-approved certification program.

1.8 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of

the Work.

B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials:

1. Hazardous materials are present in buildings and structures to be demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

a. Hazardous material remediation is specified in the following Sections . .

1) Section 028200 "ASBESTOS CONTAINING MATERIAL ABATEMENT AND DISPOSAL".
2) Section 027000 "RECYCLING OF UNIVERSAL AND HAZARDOUS WASTE".
3) Section 028300 "LEAD, CADMIUM, CHROMIUM AND ARSENIC COATINGS IN CONSTRUCTION".

b. Owner will provide material safety data sheets for hazardous materials that are known to be present in buildings and structures to be demolished because of building operations or processes performed there.

E. On-site sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video. Comply with Section 013233 "Photographic Documentation."

1. Inventory and record the condition of items to be removed and salvaged. Photograph or video conditions that might be misconstrued as damage caused by removal.
2. Photograph or video existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations or removal of items for salvage.

3.2 PREPARATION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction

and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

D. Existing Utilities to Remain: Maintain utility services to remain and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.

    a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

E. Existing Utilities to Be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off utilities when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If disconnection of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit a minimum of 24 inches below grade at or outside the building or structure to be demolished and cap, valve, or plug and seal remaining portion of pipe or conduit after bypassingin accordance with requirements of authorities having jurisdiction.
5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing by authorities having jurisdiction.

F. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment in accordance with 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 DEMOLITION, GENERAL

A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least duration required by code after flame-cutting operations.
3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.4 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Below-Grade Construction:

1. Abandon foundation systems and other below-grade construction. Cut below-grade construction flush with grade.
2. Demolish foundation systems and other below-grade construction that are within footprint of new construction and extending 5 ft. outside footprint indicated for new construction. Abandon below-grade construction outside this area.

a. Remove below-grade construction, including basements, foundation systems, and footings, completely.

3. Demolish foundation systems and other below-grade construction.

a. Remove below-grade construction, including basements, foundation systems, and footings, completely.

D. Existing Utilities:

1. Demolish and remove existing utilities and below-grade utility structures.

3.5 SITE RESTORATION

A. Below-Grade Areas:

1. Rough grade below-grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.6 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and recycle or dispose of them in accordance with Section 017419 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.8 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

SECTION 02 70 00
RECYCLING OF UNIVERSAL AND HAZARDOUS WASTE

PART 1 GENERAL

1.01 SUMMARY

A. Provide the removal, packaging, transportation and recycling of all hazardous and universal wastes specified herein in compliance with all applicable regulations and industry guidelines:
   1. Mercury-containing and Mercury-contaminated electrical materials and equipment ("MCE", for both cases), such as thermostats, equipment gauges, pressure switches, sump pump float switches, fluorescent lamp tubes and metal halide lamps.
   2. Poly-Chlorinated Biphenyl-containing and Poly-Chlorinated Biphenyl-contaminated materials ("PCB", for both cases), particularly electrical equipment, such as light ballasts and transformers.
   3. Equipment and lubricant tanks with suspect PCB-oil.
   4. Lead Acid Batteries. Suspect in exit signs.
   5. Refrigerants within air-conditioning and refrigeration equipment.
   6. Electronic waste.

B. The above listed items are universal and regulated waste included in the buildings that are proposed for demolition. If it is determined that additional universal and regulated waste is to be removed from structures, these specifications should be followed.

C. The CONTRACTOR is responsible for verifying bid quantities. The cost for the removal shall be derived through the pre-bid walk through, the quantitative survey of existing conditions and a thorough examination of the project sketches and documents.

D. The overall scope of work of this Section required in the contract is the removal, transportation, and recycling of universal waste and hazardous waste as given in the Project Manual. Specific recycling for each class of materials includes the following:
   1. MCE.
      a. Fluorescent, Mercury-Vapor, Sodium, Metal Halide, High Intensity Discharge (HID), and other Discharge based Lamps and Lighting Fixtures. All bulbs for these fixtures shall be assumed to be MCE, and shall be removed, transported, and recycled as such.
      b. Switches, Gages, Heating/Cooling Thermostats: All of these electrical switches shall be assumed to be MCE, and shall be removed, transported, and recycled as such.
   2. PCBs.
      a. Fluorescent, Mercury-vapor, Sodium, Metal Halide, High Intensity Discharge (HID), and other Discharge-based Lamps and Lighting Fixtures. All ballasts and capacitors in these fixtures shall be assumed to be PCB, and abated as such, unless they carry a label by their Original Equipment Manufacturer (OEM), certifying that they are a "Non-PCB" article. Articles so labeled shall be documented as such, but their removal and disposal thereafter may then conform to non-abatement requirements for demolition and disposal.
   3. Lead Acid Batteries: Batteries are considered a regulated universal waste by the EPA. Per ORC 3734.91, disposing of lead acid batteries in solid or hazardous waste landfills is prohibited in Ohio, and these batteries are required to be recycled at a licensed facility.
   4. Refrigerants within air-conditioning equipment.
   5. Electronic Waste: Electronic equipment is considered a regulated waste if not recycled, and must be evaluated to determine if it exhibits a characteristic of hazardous waste. Per OAC 3745.51.02, electronic waste is not regulated as a hazardous waste if properly recycled.

E. Related Work Specified Elsewhere:
   1. Section 02 82 00, Asbestos Containing Material Abatement and Disposal
   2. Section 02 83 00, Lead, Cadmium, Chromium and Arsenic Coatings in Construction

1.02 REFERENCES

A. Code of Federal Regulations (CFR)
   1. 29 CFR 1910: Occupational Safety and Health Standards;
   2. 29 CFR 1926: Safety and Health Regulations for Construction;
   3. 49 CFR 172: Hazardous materials table, special provisions, hazardous materials communication, emergency response information, and training requirements;
   4. 40 CFR Part 82, Subparts A and F, Section 608 of the Clean Air Act;
   5. 49 CFR 173: Shippers - general requirements for shipments and packagings;
   6. 40 CFR 261: Identification and Listing of Hazardous Waste;
   7. 40 CFR 262: Standards applicable to Generators of Hazardous Waste;
   8. 40 CFR 263: Standards applicable to Transporters of Hazardous Waste;
   9. 40 CFR 273: Standards for Universal Waste Management; and
   10. 40 CFR 731: Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and use Prohibitions.

B. State Regulations:
   1. OAC 1301:7-7-28: Ohio Fire Code Article 28, Flammable and Combustible Liquids, Ohio Department of Commerce, OAC 1301:7-7-28;
   2. OAC 3745-51: Identification and Listing of Hazardous Waste;
   3. OAC 3745-52: Generator Standards;
   4. OAC 3745-53: Transporter Standards;
   5. OAC 3745-273: Management Standards for Universal Waste; and
   6. OAC 3745-279: Used Oil Management Standards.

C. Other Regulations: All other federal, state, county, municipal, and local statutes, ordinances, regulations, or rules pertaining to construction safety and health and hazard communication (worker right-to-know), and contractor or other licensure, certification and regulation.

1.03 DEFINITIONS

A. Ballast: includes both magnetic and electronic ballasts used to regulate the current and power to fluorescent and HID lamps.

B. Battery: a device consisting of one or more electrically connected electrochemical cells which are designed to receive, store, and deliver electric energy, including nickel-cadmium and lead-acid batteries.

C. Capacitor: a device found in ballasts for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by dielectric.

D. Dielectric fluid: a liquid dielectric which insulates and cools the electrode and conveys the spark.

E. Electronic ballast: a non-magnetic device that uses printed circuitry to regulate the power and current for fluorescent lamps. Uses circuit boards, rather than dielectric fluid; however, may contain lead within soldering and cause ballast to be classified as hazardous waste.

F. Electronic waste: electrical and electronic equipment without the intent of re-use or at the end of “useful” life. Typical electronic waste may consist of screens, monitors, large equipment and appliances, IT and telecommunication equipment.

G. Florescent lamp: a low intensity discharge lamp that contains mercury and is commonly used in commercial and industrial lighting. Fluorescent lamps include tubes, circular and compact fluorescent lighting products.

H. Generator: a person, by site, whose act or process produces hazardous waste identified or listed in OAC Chapter 3745-51 or whose act first causes a hazardous waste to become subject to hazardous waste rules.

I. High Intensity Discharge (HID) lamp: mercury, metal halide and high-pressure sodium lamps that contain mercury.

J. Lamp or universal waste lamp: a bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible and infra-red regions of the electromagnetic spectrum.

K. Magnetic ballast: light ballast that may include capacitors containing PCB-containing dielectric fluid.

L. Mercury-containing equipment: a device or part of a device that contains elemental mercury integral to its function.

M. Polychlorinated Biphenyl (PCB): a chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances. Refer to 40 CFR 761.1(b) for applicable concentrations of PCBs.

N. Transfer facility: a transportation-related facility including loading docks, parking areas, and other similar areas where shipments of PCB waste are help during the normal course of transportation. Transport vehicles are not transfer facilities unless they are used for the storage of PCBs, rather than for actual transport activities.

O. Transporter of PCB waste: 40 CFR 761, Subpart K, any person engaged in the transportation of regulated PCB waste by air, rail, highway, or water for purposes other than consolidation by a generator.

P. Universal waste: any of the following hazardous wastes that are subject to the universal waste requirements of OAC Chapter 3745-273.
   1. Batteries as described in OAC 3745-273-02.
   2. Thermostats, switches and other mercury-containing devices as described in OAC 3745-273-04; and
   3. Lamps as described in OAC 3745-273-05.

1.04 SUBMITTALS

A. CONTRACTOR must provide copies of all manifests or other transportation documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 REMOVAL AND RECYCLING OF UNIVERSAL WASTE

A. Locate and carefully remove, without damaging, items defined as universal waste (batteries, thermostats, fluorescent and HID lamps).

B. Manage all universal waste in a way that prevents releases of any universal waste or component of a universal waste.

C. Carefully place undamaged/unbroken universal waste items in appropriate containers for temporary storage and shipment. Packaging of lamps, ballasts and other equipment shall meet all DOT and EPA requirements for proper transportation of materials for disposal and/or recycling.
   1. Mercury-containing equipment: Intact mercury-containing lamps must be packed in strong outer packaging with all seams and joints sealed which will prevent the escape of mercury from the package. Lamps should be segregated according to size and type (linear, circular, HID, etc.).
   2. No broken lamps may be shipped in the same package with intact lamps. Broken lamps shall be placed in a separate container and stored in an appropriate, labeled container for recycling or disposal.

D. Universal waste containers shall be clearly labeled as “Universal Waste” and to identify: 1) the Owner, 2) the facility and address the materials have been removed, 3) the initial date on which the container was filled, 4) the type of universal waste, and 5) all EPA or DOT-required labels.

E. The CONTRACTOR shall sign manifests or other transportation documents, accepting liability for certification that the shipment meets EPA and DOT requirements for proper description, packaging, marking and labeling.

F. Batteries, thermostats, fluorescent and HID lamps shall be sent to an EPA-approved chemical waste processing site and recycled.

G. The CONTRACTOR shall submit all manifests or other transportation documents to the OWNER upon receipt.

3.02 REMOVAL AND RECYCLING OF HAZARDOUS WASTE

A. During removal of any system containing chemicals, gases or refrigerants, the appropriate equipment shall be used to capture these substances and prevent their release to the atmosphere. All refrigerants should be removed and recycled by an EPA-certified HVAC technician.

B. Electronic equipment is considered a regulated waste if not recycled, and must be evaluated to determine if it exhibits a characteristic of hazardous waste. Per OAC 3745.51.02, electronic waste is not regulated as a hazardous waste if properly recycled.

C. If any hydraulic oil equipment is to be disposed, the presence or absence of PCBs shall be verified, by testing if necessary. Comply with disposal requirements and procedures as outlined in 40 CFR 761.

D. If hydraulic oil has greater than 50 ppm total concentration of PCBs, it is considered a hazardous material regulated under TSCA. PCB fluids must be disposed of in a TSCA-compliant incinerator, chemical waste landfill, or by an EPA-approved alternative method. TSCA allows equipment that used PCB hydraulic fluid to be disposed of in a municipal solid waste landfill if the units have been drained of all free-flowing liquids. Hydraulic equipment that contained PCB hydraulic fluid greater than 500 ppm must be flushed with a solvent before disposal. The drained liquid and solvents must be disposed of as PCB waste.

E. Locate and carefully remove without damaging all light fixture ballasts. All light ballasts designated for removal and disposal shall be recycled. These ballasts include PCB-containing ballasts and ballasts labeled as “Non-PCB”.

F. The Contactor shall manage all ballasts in a way that prevents releases of any hazardous substances or component of a hazardous substance.

G. Carefully place ballasts in appropriate containers for temporary storage and shipment. Packaging of lamps, ballasts and other equipment shall meet all DOT and EPA requirements for proper transportation of materials for disposal and/or recycling.

H. Ballast disposal containers shall be clearly labeled to identify: 1) the Owner, 2) the facility and address the materials have been removed, 3) the initial date on which the container was filled, 4) a unique identification number, 5) a description of contents, and 6) all EPA or DOT-required labels.

I. The CONTRACTOR shall sign manifests or other transportation documents, accepting liability for certification that the shipment meets EPA and DOT requirements for proper description, packaging, marking and labeling.

J. Under the Toxic Substance Control Act (TSCA), fluorescent light ballasts containing hazardous substances should be transported by an approved hazardous waste transporter to an EPA-approved chemical waste processing site and recycled.

K. The CONTRACTOR shall submit all manifests or other transportation documents to the OWNER upon receipt.

END OF SECTION

SECTION 02 82 00
ASBESTOS CONTAINING MATERIAL ABATEMENT AND DISPOSAL

PART 1 GENERAL

1.01 SUMMARY

A. This section includes abatement, removal, and disposal of asbestos-containing material (ACM) as scheduled herein for the Preble County Full Service Maintenance Facility project in West Alexandria, Ohio.

B. Refer to the Hazardous Materials Survey report, to be kept on-site during abatement. The CONTRACTOR should use this report as a reference only and not use this report for bidding purposes.

C. Furnish all labor, materials, equipment and incidentals required for the following:

1. Identification and removal of various materials that contain or may contain asbestos fibers as part of the demolition or renovation of existing structures.
2. Disposal of all confirmed ACM.

D. Related Work Specified Elsewhere:

1. Section 02 70 00, Recycling of Universal and Hazardous Waste
2. Section 02 83 00, Lead, Cadmium, Chromium and Arsenic Coatings in Construction

E. Removal and Disposal: This section requires the removal and subsequent off-site disposal of ACM and non-ACM including but not limited to the following:

1. The CONTRACTOR will be responsible for staffing the required personnel to remove the following ACM if these materials will be rendered friable and considered as Regulated ACM by demolition activities. See remediation and demolition drawings.

TABLE 1 – IDENTIFIED ACM

Location	ACM	ACM Cat**	Approximate Quantity*
Office Building/Garage			
Room Nos. 1, 2, 3, 9, 10, 11 and 12	12”x12” Floor tile – tan with brown	Cat. I	1,900 sf
All single and double swinging doors throughout the structure	Tan door caulk	Cat. II	20 units
	Gray caulk – flexible (door frame)	Cat. II	
	Gray caulk – hard (door frame)	Cat. II	
	Black caulk – door frame	Cat. II	
Room Nos. 1, 2, 3, 4, 5 and 9	Gray window glazing – exterior	RACM	12 units
	Brown caulk – window	Cat. II	
Roof parapets and fascia	Brown caulk – Roof 2” strips	Cat. II	930 sf

*sf – square feet
**Category – Category I Nonfriable ACM (Cat. I), Cat II Nonfriable ACM, Regulated ACM (RACM)

2. The following items were identified to contain less than 1% asbestos and are not regulated by the Ohio EPA; however, these levels are regulated by OSHA.

TABLE 2 – IDENTIFIED <1% ACM

Location	<1% ACM
Office Building/Garage	
Room Nos. 1, 2, 3, 4, 5 and 9	Gray window glazing – interior
Room No. 1 (entryway) and Room No. 4	Gray epoxy floor coating – with white flecks
Room Nos. 6, 7 and 8	White caulk – security glass

3. The ACM flooring is Category I Non-friable ACM and is not required to be removed prior to demolition as long as the material does not become friable during the demolition process. When Category I non-friable ACM remains in the building during demolition, the building demolition debris cannot be recycled or used as fill and must be disposed of as construction demolition debris.
4. The ACM door caulk, window caulk, window glazing and roof caulk are Category II Non-friable ACM. When Category II Non-friable ACM remains in the building during demolition, the entire building demolition debris must be disposed of at an EPA licensed asbestos landfill and follow appropriate OSHA requirements to protect workers and the public during demolition.
5. The following suspect building materials were not sampled for asbestos as part of this survey since the materials were inaccessible until demolition, the integrity of the material would have been compromised, or due to the potential danger to the sample collector. These materials will be analyzed by Resource International, Inc. prior to demolition once accessible and the building has been de-energized.
   a. Pipe flange gaskets;
   b. Fire doors;
   c. Boiler insulation;
   d. Van Packer© breeching; and
   e. Electrical wiring, tape and equipment.
6. Resource International, Inc. is responsible for the asbestos abatement design for the project. Resource International, Inc. is located at 6350 Presidential Gateway, Columbus, Ohio 43231. The Certified Asbestos Hazard Abatement Project Designers are Katherine K. Engel-Shepard, Certification No. PD60776 and Michelle Eckels, Certification No. PD60600.
7. The above listed quantities are provided to detail the magnitude of the project, and should not be used as estimated quantities for bidding. The CONTRACTOR is responsible for verifying bid quantities. The cost for the removal shall be derived through the pre-bid walk through, the quantitative survey of existing conditions and a thorough examination of the project documents.

1.02 REFERENCES

A. Reference Standards:
   1. American Industrial Hygiene Association (AIHA)
   2. American National Standards Institute (ANSI)
   3. Department of Transportation (DOT)
   4. Environmental Protection Agency (EPA)

5. Mine Safety & Health Administration (MSHA)
6. National Institute of Occupational Safety and Health (NIOSH)
7. Occupational Safety and Health Administration (OSHA)
8. Ohio Environmental Protection Agency (Ohio EPA)
9. Underwriter's Laboratories (UL)

1.03 DEFINITIONS

A. Abatement: Procedure to control or otherwise limit fiber release from friable asbestos containing materials or asbestos contaminated materials. Includes stripping, removal, encapsulation, enclosure, O&M, repair, disposal and decontamination.

B. Aggressive Sampling: An air sampling technique typically used for final clearance wherein the area and surfaces around the air sample are agitated, brushed, blown with air jets (leaf blower) or mechanical fans, or otherwise disturbed in an effort to re-suspend any settled dust and detect the presence of residual asbestos fibers.

C. Air Lock: A system for permitting entrance or exit without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of 2 curtained doorways at least 3 feet apart.

D. Air Sampling: See Area Monitoring below.

E. Air Monitoring Technician: An employee of the CONTRACTOR fully trained in the air sampling process including, but not limited to, ORM and NIOSH Method 7400 procedures, and maintenance and operation of air sampling equipment in accordance with existing regulations who shall conduct air monitoring.

F. Amended Water: Water containing a wetting agent or surfactant.

G. ANSI: American National Standards Institute.

H. Asbestos: A class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are Chrysotile, Crocidolite, Amosite, Anthophyllite asbestos, Tremolite asbestos, and Actinolite asbestos.

I. Asbestos-containing Building Material (ACBM): Material composed of asbestos of any type and in any amount greater than 1% by weight, either alone or mixed with other fibrous or nonfibrous materials used in the construction of the structure and/or the protection of the structure from fire hazard.

J. Asbestos-containing Material (ACM): Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or nonfibrous materials.

K. Asbestos Contaminated Material: Any materials, substances or item impregnated or coated (no matter how lightly) with asbestos fibers.

L. Asbestos Fibers: Magnesium-silicate mineral (asbestos) fibers having an aspect ratio of at least 3:1 and 5 micrometers or longer.

M. Asbestos Filtration Device (HEPA Negative Air Filtration System): Filtered exhaust ventilation equipment used for drawing air from inside containment/regulated work areas for reducing airborne asbestos levels in work areas, and for exhausting filtered air from a work area to achieve a pressure differential such that the work area's pressure is less than the pressure in areas immediately adjacent to the work area. Such equipment must have at least three filter stages, including readily accessible pre-and secondary filters, and a final filter which must be a High Efficiency Particulate Air (HEPA) filter rated 99.97% effective in capturing particles having diameters of 0.3 micrometers or greater.

N. Asbestos Abatement Contractor/CONTRACTOR: A Contractor with a valid license, certification or registration issued by a governmental authority of the State in which the Work is to be performed, to perform directly or indirectly in any asbestos hazard abatement activity.

O. Asbestos Permissible Exposure Limit (PEL): 0.2 fibers (longer than 5 micrometers) per cubic centimeter as an 8-hour time weighted average.

P. Area Monitoring (Air Sampling): Sampling of asbestos fiber concentrations in the air within the regulated/containment area and outside the regulated/containment area which is representative of the airborne concentrations of asbestos fibers which may reach the breathing zone.

Q. Barrier: Polyethylene sheeting and/or other materials which, when used in conjunction with the existing floors, ceilings, and walls of the structure, form the containment/regulated area. The barrier separates the contaminated work environment from the uncontaminated environment.

R. Clean Room: An uncontaminated room outside and apart from the decontamination area containment/regulated area, with provisions for storage of worker's street clothes and protective equipment.

S. Curtained Doorway: Device to allow entrance or exit from 1 room to another while restricting air movement between the rooms. Typically constructed by placing 3 overlapping sheets of polyethylene film over an existing or temporarily framed doorway, securing all sheets along the top of the doorway, securing the vertical edge of the outside sheet along one vertical side of the doorway, the second sheet along the doorway vertical edge opposite the first, and the third sheet around the entire doorway (including base). The third sheet must be slit down the center to within one foot of each end to facilitate access by personnel. Two Curtained Doorways should be spaced a minimum of 3 feet apart to form an Air Lock.

T. Decontamination Area: A series of enclosed connected rooms adjacent to or connected to the regulated area and consisting of an equipment room, shower area, and clean room which is used for decontamination of workers, materials and equipment. It permits equipment and personnel movement to and from the work area while preventing airflow from the work area.

U. Disposal: All specified procedures necessary to transport and deposit the ACM or asbestos-contaminated materials removed from a building to an approved waste disposal site in compliance with existing Section 61.52 and .56 of the EPA Regulations (40 CFR 61), and Sections 172.101 and 173.1090 of the DOT Regulations (49 CFR), or such other or additional regulations as may be in force.

V. Enclosed Regulated Area: A regulated area which has been isolated by physical boundaries to prevent the spread of asbestos dust, fibers, or debris. A local exhaust system is required.

W. EPA (U.S. EPA): United States Environmental Protection Agency.

X. Equipment Room (Change Room): A contaminated room located within the decontamination area that is supplied with impermeable bags or containers used for storage of contaminated protective clothing and equipment prior to disposal.

Y. Fibers: All fibers regardless of composition as counted in the NIOSH P&CAM 239 or 7400 procedures, or asbestos fibers of any size as counted using either scanning or transmission electron microscopy.

Z. Friable Asbestos Material: Material that contains more than 1% asbestos by weight which can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

AA. Glovebag Technique: A method with limited applications for removing small sections of asbestos-containing material from HVAC ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces in a non-contained regulated area.

BB. HEPA Negative Air Filtration System: High efficiency particulate air (HEPA) filtered exhausting equipment with a UL 586 filter system capable of collecting and retaining asbestos fibers. Filters shall be of 99.97% efficiency for retaining 0.3 micrometer diameter particles.

CC. HEPA Vacuum Equipment: High efficiency particulate aerosol filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be capable of retention efficiency of 99.97% to absolute standards at 0.3 microns.

DD. HVAC: Heating, ventilating and air conditioning; all building mechanical equipment including exhaust equipment, supply and return ductwork, unit ventilators, fan-coil units, blower cabinets and fans, control devices, damper assemblies and other similar mechanical equipment.

EE. Independent Testing Laboratory: A qualified organization capable of performing air sampling analysis (PLM) and bulk sampling analysis (PCM) with no affiliation with CONTRACTOR or OWNER and in possession of an EPA interim accreditation as a minimum and/or NIOSH certification.

FF. Lagging: Thermal insulation used to prevent heat loss or condensation from pipes, boilers and similar mechanical equipment. The insulation may be covered with a metal jacket.

GG. NIOSH: National Institute for Occupational Safety and Health.

HH. Non-Friable Asbestos Material: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and may not release fibers in excess of the action level during any appropriate use, handling, storage, transportation, or processing. Non-friable asbestos material is considered hazardous during removal and disposal procedures.

II. OSHA (USOSHA): United States Department of Labor, Occupational Safety and Health Administration.

JJ. OSHA Reference Method (ORM): Sampling and analytical method specified in Appendix A of 29 CFR 1926.58.

KK. Personal Monitoring: Air sampling of asbestos fiber concentrations within the breathing zone of an employee inside the work area where asbestos removal activities are being performed.

LL. Potentially Containing Asbestos-containing Material: Material suspected to contain ACM for which no laboratory test has been completed.

MM. Prior Experience: Experience required of the Contractor Subcontractor on asbestos projects of similar nature and scope to ensure capability of performing the asbestos removal in a satisfactory manner. Similarities shall be inside areas related to material composition, project size, number of employees and the engineering work practice and personal protection controls required.

NN. Work Area: A regulated area as defined by 29 CFR 1926 where airborne concentrations of asbestos, exceed or can reasonably be expected to exceed the asbestos permissible exposure limit prescribed above in this Section.

OO. Removal: All specified procedures necessary to gather, enclose in polyethylene bags and/or sealed drums, and make ready for disposal all removed ACM or asbestos-contaminated material.

PP. Surfactant: A chemical wetting agent added to water to reduce its surface tension and thereby improve its penetrating capabilities into ACM.

QQ. Stripping: All specified procedures necessary to remove ACM or asbestos contaminated materials from their substrate or from any building component or structure.

RR. Thermal System Insulation (TSI): Material applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

SS. Time Weighted Average (TWA8): The TWA is an 8-hour time weighted average of airborne concentration of fibers (5 micrometers or longer) per cubic centimeter of air.

TT. Shower Room: A room between the Clean Room and the Equipment Room in the decontamination area with facilities for showering and equipment cleaning. The shower room comprises an airlock between the clean area and the work area.

UU. Wet Cleaning: The process of removing ACM residual debris or asbestos contaminated material from building surfaces, equipment, objects, tools, disposal containers, etc. This may be accomplished by washing with water utilizing cloths, mops, sponges, or brushes, or by showering with water in the Shower Room.

1.04 SYSTEM DESCRIPTION

A. The Work in this Section shall include providing all labor, equipment, materials, appurtenances, and incidental required for the complete removal, containment, transporting, and disposal of the ACM, to include the cleaning/decontamination and/or collection and disposal of adjacent materials which may become contaminated during the removal process.

B. The cost for the removal shall be derived through the pre-bid walk through, and a thorough examination of the project drawings and documents.

C. The OWNER will provide only the following in regards to access:

1. The OWNER will allow access to the Site daily. It is anticipated the CONTRACTOR will work whatever shifts required in order to comply with the Contract completion requirements stipulated. It is necessary for the CONTRACTOR to provide OWNER access as required and to maintain operations. The OWNER has the authority to stop work whenever conditions are not within the requirements of the contract documents and/or applicable regulations; resulting expenses are to be borne by the CONTRACTOR.

D. The CONTRACTOR shall provide all items in accordance with this paragraph.

1. The CONTRACTOR shall secure the immediate work area(s) during work periods for the duration of the Project as required by either the General Conditions, Specifications, Federal and State Regulations governing asbestos removal and disposal, City ordinances, and OSHA requirements. The CONTRACTOR is totally responsible for all safety and security of CONTRACTOR equipment.
2. Transfer of the removed asbestos material from the building to the transporting vehicle shall be accomplished through the nearest exit, except the use of the exit cannot totally restrict operation or performance of the Work. The proposed exits to be used shall be reviewed by the OWNER for acceptability prior to usage. No other exits will be used without prior written acknowledgement of the OWNER, except for emergency situations. The CONTRACTOR shall be responsible for controlling both vehicle and pedestrian traffic without endangering operations personnel and the public transferring of ACM.

3. The CONTRACTOR shall seal off areas of the building in compliance with OSHA and EPA regulations concerning signage and labeling and as acknowledged by the OWNER. Proceed with Work allowing only authorized personnel directly involved in the removal of asbestos to enter.

1.05 SUBMITTALS

A. The following should be submitted to the OWNER for review:

1. Licenses, Permits and Certifications: Submit copies of current valid licenses, permits, and certifications required by state and local regulations for the CONTRACTOR performing the work.
2. Qualifications, licenses, experience and example projects of similar size and scope of any third-party Asbestos Abatement Contractor.

B. Pre-abatement Submittals.

1. Pre-abatement submittals shall be submitted to the OWNER one (1) week prior to the start of work.
   a. Provide copies of notifications to the following:
      1) Ohio Environmental Protection Agency (EPA) Notification.
   b. Copy of license to conduct asbestos abatement activities.
   c. The CONTRACTOR shall have a minimum of 5-years of experience in asbestos abatement. This experience shall be submitted in writing, listing those projects of similar size and complexity.
      1) Name, certification and health records of supervisor.
      2) Name, certification and health records of workers.
      3) Detailed work plan.
      4) Emergency contact list.
      5) Copy of proof of insurance.
   d. Detailed drawings for each of the work/regulated areas identified in Section 1.01 including, but not necessarily limited to, locations for personal decontamination units and waste out units, location of negative air machines, designated dumpster locations, and suggested route for removal of contaminated materials.
   e. Provide a listing of all products, tools and equipment that will be used during the project such as, but not limited to, adhesives, surfactants, penetrating encapsulants, bridging encapsulants, hand tools, ladders, scaffolds, vacuums, negative air machines, and disinfectants.
   f. A site-specific health and safety plan shall be present on-site, and must address general health and safety issues and company standard operating procedures. At a minimum, the site-specific health and safety plan shall include consideration of fire, explosion, hazardous atmospheres, electrical hazards, slips/trips and falls, confined spaces, evacuation procedures, and heat stress illness.

C. Post-abatement submittals.

1. Post-abatement submittals shall be submitted to the OWNER no later than one (1) month after substantial completion of abatement work. Submittals shall include the following: original landfill receipts; waste hauler's manifest; CONTRACTOR's log of air samples; daily logs; asbestos abatement plans showing final quantities abated.
2. Project Log: The CONTRACTOR shall submit a copy of the Daily Project logs. The log will be used each date of the project to record the following information:
   a. Name of project superintendent, abatement workers, and actual time physically on job for both persons.

b. Brief description of daily Work accomplishments.

c. Listing of all employees and others on the job.

d. Description of any significant events, incidents, or unusual occurrences, including but not limited to, deviations of plans, contract requirements, or specifications, emergencies, accidents or dangerous conditions, and steps taken to assure continued security of the work area.

3. The log will also include copies of routine inspection reports, results of air monitoring and analysis, project minutes, chain-of-custody forms and any other routine documents relating to project activities. The log for any project will be made available for inspection by the OWNER.

1.06 QUALITY ASSURANCE

A. General Applicability of Codes, Regulations, and Standards

1. Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as published copies are bound herewith.

B. OWNER Responsibility

1. The OWNER may choose to provide a third-party environmental consultant to perform services to review CONTRACTOR submittals, inspect additional inaccessible materials at the time of conducting the hazardous materials survey, inspect the work performed, conduct clearance inspection and testing, and final closeout document review.

C. CONTRACTOR Responsibility

1. CONTRACTOR is to notify the OWNER when the electrical system has been de-energized and any other building components which could not be safely accessible and tested for asbestos. The third-party environmental consultant will then inspect and conduct testing if determined necessary.

2. The CONTRACTOR shall assume full responsibility and liability for the compliance with all applicable federal, state, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

3. The CONTRACTOR shall provide a “designated or competent person” on-site during all asbestos removal and disposal activities as required.

4. The CONTRACTOR is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations.

5. The CONTRACTOR shall hold the OWNER harmless for failure to complete with any applicable work, hauling, disposal, safety, health, or other regulation on the part of itself, its employees, or its subcontractors.

D. Federal Requirements:

1. Federal requirements which govern asbestos hazard abatement work include, but are not limited to, the following:

a. U.S. Department of Labor, Occupational Safety & Health Administration (OSHA) including, but not limited to:

1) Occupational Exposure to Asbestos; Final Rules; 29 Code of Federal Regulations (CFR) 1926.1101 and 29 CFR 1926.58.

2) Respirator Protection; 29 CFR 1926.1101 and 29 CFR 1910.1001.

3) Construction Industry; 29 CFR 1926.

4) Access to Employee Exposure and Medical Records; 29 CFR 1926.1101.

5) Hazard Communication; 29 CFR 1926.1101.

6) Specifications for Accident Prevention Signs and Tags; 29 CFR 1926.1101.

b. U.S. Environmental Protection Agency (EPA) including, but not limited to:

1) National Emission Standard for Hazardous Air Pollutants; 40 CFR 61 Subpart A.

2) National Emission Standard for Hazardous Air Pollutants Amendments to Asbestos Standard; 40 CFR 61 Subpart M.

3) National Requirements: Reportable Quantity Adjustments; 40 CFR 763.117 and 40 CFR 763.302.

4) Asbestos-containing Materials in Schools Final Rule and Notice; 40 CFR 763 Subpart E.

c. U.S. Department of Transportation (DOT) 49 CFR 171 and 172 Hazardous substances.

E. State Requirements.

1. State requirements which govern asbestos hazard abatement work include, but are not limited to, the following:

a. State of Ohio, Outline of the State of Ohio Asbestos Hazard Abatement Act, Chapter 3710, Ohio Revised Code.

b. Ohio EPA, Chapter 3745-20 to 3745-22 of the Ohio Administrative Code.

F. American National Standards Institute (ANSI)

1. Z88.2-80 Practices for Respiratory Protection

G. National Institute of Occupational Safety and Health (NIOSH)

1. Respiratory Protection - An Employer's Manual & Respiratory Protection - A Guide for the Employee

H. Underwriters Laboratories, Inc. (UL) Publications

1. 586-77 Test Performance of High Efficiency, (R 1982) Particulate, Air Filter Units

I. American Industrial Hygiene Association (AIHA) publications

J. Mine Safety & Health Administration (MSHA)

K. Other Regulations: All other federal, state, county, municipal, and local statutes, ordinances, regulations, or rules pertaining to asbestos, including its abatement, storage, transportation and disposal; construction safety and health and hazard communication (worker right-to-know), and contractor or other licensure, certification and regulation.

L. Maintain current licenses, permits and certifications as required by applicable federal, state or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to Work of this contract.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Asbestos Handling Procedures:

1. General Procedures: Sufficiently wet the asbestos material with a fine spray of amended water during removal, cutting, or other handling to reduce the emission of air borne fibers. Remove material and immediately place in plastic disposal bags or double wrap in 6-mil polyethylene.

2. Sufficiently wet asbestos material with a fine spray of amended water during removal or other handling to reduce the emission of airborne fibers. Abrading, sanding, drilling, cutting, or machining of these materials is prohibited unless approved by the Consultant. Do not allow excessive water to accumulate in the

work area. Keep all removed material wet enough to prevent fiber release until it can be containerized for disposal.

3. ACM shall be removed in manageable sections. Removed material shall be containerized before moving to a new location for continuance of work.
4. ACM removed from the building shall not be dropped or thrown to the floor. Material shall be removed as intact sections whenever possible and carefully lowered to the floor. Asbestos materials in open containers shall be kept wet at all times.
5. Containers (drums or two 6-mil polyethylene bags or wrap) shall be sealed when full. Wet material will be heavy and double bagging or wrapping of waste material is required. Bags shall be placed in drums or dumpsters for staging and transportation to the disposal site. Where unusual circumstances prohibit use of plastic disposal bags or drums, the Abatement Contractor shall submit, in the asbestos plan, an alternate proposal for removal, containerizing, and disposal of the asbestos materials and fibers.
6. Asbestos-containing or contaminated waste with sharp edged components (e.g., nails, screws, metal lath, tin sheeting) that could otherwise tear polyethylene bags shall be placed directly into drums or dumpsters for disposal.

B. Protective Packaging:

1. Appropriately labeled two (2) six (6) mil sealable polyethylene bags as a minimum.
2. For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated - EPA regulation, 40 CFR 61.150 (a)(1)(v), dated November 20, 1990.
3. Labels on glovebags, waste packages, contaminated material packages and other containers shall be in accordance with EPA or OSHA standards.

C. Warning Labels and Signage:

1. As required by 29 CFR 1926.1101 (k)(7), 40 CFR 61.149 (d)(1)(I),(ii), and (iii) (revised 11/20/90), and other pertinent State and local regulations.

1.08 PROJECT/SITE CONDITIONS

A. Temporary Facilities:

1. Materials and Equipment:
   a. Water Service: CONTRACTOR will provide decontamination facilities. CONTRACTOR shall provide hot and cold water for decontamination showers. CONTRACTOR shall be allowed to tie into OWNER's water supply. CONTRACTOR shall assure and protect against water leaking away from decontamination facility.
   b. Electrical: Comply with all applicable National Electrical Manufacturers Association (NEMA), National Electrical Contractors Association (NECA) and Underwriters Laboratories (UL) standards and regulations for materials and electrical service. CONTRACTOR shall provide ground fault circuit interrupters. All electrical power used for this project shall be provided via these units.
   c. First Aid: Comply with governing regulations and recognized recommendations within the construction industry. CONTRACTOR shall be responsible for providing appropriate amount of first aid supplies for employees.
   d. Documents: CONTRACTOR will maintain and post all required documents on site.

e. Supply Storage: CONTRACTOR will not be permitted to store supplies outside of the area designated by the OWNER.

f. Storage of asbestos-containing waste: Properly labeled and bagged waste must be stored in a lockable and secure storage container on the ground level.

B. Damage: Promptly repair damage caused to adjacent facilities by work. The CONTRACTOR shall repair and/or replace all materials that are found to have been damaged during the course of the asbestos removal work and cleanup procedures. The CONTRACTOR is responsible for determining if any materials, furnishings, equipment, etc. are not in good condition prior to commencing work at the site.

C. Dress and Equipment (Minimum Requirements):

1. Workers shall wear disposable, full-body coveralls with hoods and boots in the work area. Disposable clothing shall not be re-worn in the work area. Footwear may be disposable. Non-disposable footwear shall be left in the work area at all times until disposal at job completion. Eye protection, safety gloves and shoes, and hard hats shall be worn as required by job conditions and safety regulations.

2. According to OSHA CFR Title 29, Section 1910.1001, SEC, Engineering Controls are required to meet exposure limits. For this reason, air cleaning mechanisms are required to minimize airborne fibers.

3. The CONTRACTOR shall screen workers to determine if they are able to perform the work and wear respirators, and shall also instruct and train his employees in the need for and the method of performing proper work practices. The CONTRACTOR shall supervise these work practices to assure compliance.

4. In accordance with NIOSH, OSHA and ANSI Regulations, the respiratory program must consist of the following:

a. Single use, disposable respirators are prohibited.

b. Employee training covering the hazards of asbestos, respiratory protection and decontamination procedures.

c. Daily personal monitoring of most highly exposed worker in accordance with the "EPA Guidance Document," page 47, Personnel Monitoring.

d. Respiratory protection appropriate for the fiber level encountered and with a protection factor capable of providing less than 0.01 f/cc inside the worker's respiratory, or as required for other toxic or oxygen-deficient situations encountered.

e. Medical exams consisting of chest X-rays, pulmonary function tests, and history of respiratory disease.

5. The CONTRACTOR's employees shall be instructed on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA Regulations. The CONTRACTOR shall supervise work practices to assure compliance with regulations.

1.09 SEQUENCING

A. The sequence of execution for each work area shall be as follows:

1. Prepare work area.
2. Pre-clean all surfaces and equipment to be abated.
3. Remove ACM.
4. Remove and dispose of the contaminated waste generated by work area preparation and removal activities.
5. Encapsulation of work area surfaces.
6. Decontaminate work area and clean Site.

7. Perform visual final clearance inspection and final clearance air sampling.
8. Punch-out project.

1.10 SCHEDULING

A. Conduct Work so as to avoid interference with operations and work in the existing facilities.

B. Include provisions for temporary services, as required, to ensure no interruption of OWNER operations.

C. Before any ACM abatement and disposal work begins, the CONTRACTOR shall obtain approval of all necessary outage requests prior to commencement of work from the OWNER.

D. All Work within a regulated area of the building not related to asbestos removal shall cease except for operations required to be maintained for which provisions shall be made during asbestos removal operations.

E. The work site shall be made available to authorized government personnel who have authority to inspect the work site and to conduct inspections and make tests for EPA and OSHA compliance. The work site may also be visited by the OWNER, State regulatory personnel or the State Industrial Commission.

PART 2 PRODUCTS

2.01 MATERIALS

A. Surfactant: Mix according to manufacturer's written instructions with water to ensure proper wetting of the ACM and retardation of fiber release during disturbance of the material.

B. Construction Materials: Lumber, nails, hardware, shower stalls, hoses, plumbing, drain pans, storage drums, etc. Other tools and equipment, not specifically described but required for a complete and proper performance, shall be subject to approval by the Consultant.

C. Encapsulant: A liquid material which can be applied to ACM and which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). The encapsulant should be tested and EPA accepted at Battelle Laboratories in Columbus, Ohio under EPA Contract #68-03-2552-T2005.

D. Polyethylene sheeting, spray adhesive and tape: Sufficient quantities of 6-mil, minimum, flame-retardant polyethylene, spray adhesive, and tape to perform all required sealing, regulated area construction, and wrapping of specific waste. Polyethylene sheeting shall conform to requirements set forth by National Fire Protection Association Standard 701, Small Scale Fire Test for Flame Resistant Textiles and Films. The spray adhesive shall be formulated to aggressively bond polyethylene sheeting to itself. Tape shall be capable of sealing joints of adjacent sheets and for attachment of poly to finished/unfinished surfaces, and shall be capable of adhering under dry and wet conditions, including use of amended water.

E. Disposal Containers: Shall be suitable to receive and retain asbestos-containing or contaminated materials until disposal at an approved landfill. The containers shall be labeled in accordance with OSHA, EPA, and DOT Regulations. The containers must be air and watertight. If polyethylene bags are permitted for use, they shall be constructed of transparent 6-mil polyethylene.

F. Respirators: Select respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing asbestos

fibers. Provide personnel engaged in the removal or demolition of pipes, structures, or equipment covered or insulated with asbestos, or in the removal or demolition of asbestos, or in the removal or demolition of asbestos insulation or covering, respiratory protection appropriate for the fiber level encountered and with a protection factor capable of providing less than 0.01 f/cc inside the worker's respirator, or as required for other toxic or oxygen-deficient situations encountered. Respirators shall be equipped with high-efficiency particulate air (HEPA) filters.

G. Protective Clothing: Furnish personnel exposed to airborne concentrations of asbestos fibers with disposable protective whole-body clothing, head coverings, gloves, and foot coverings as required for the particular work process. Furnish disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. Use tape to secure sleeves at the wrists and to secure foot coverings at the ankles.

H. Change Rooms: Provide a temporary unit with a separate decontamination room for personnel required to wear whole body protective clothing. Keep asbestos-free street clothing and shoes in the clean room. Vacuum and remove asbestos-contaminated disposable protective clothing while still wearing respirators at the boundary of the regulated area, place removed disposable protective clothing into impermeable bags or containers and seal for disposal. Remove cloth work clothing in the decontamination room. Tag and bag cloth work clothes for laundering and keep work shoes in the decontamination locker. Locate showers between the decontamination locker room and the clean locker room, and require employees to shower before changing into street clothes. Do not wear work clothing between home and work. Clean asbestos contaminated work clothing in accordance with 29 CFR 1926.58. Change rooms shall be physically attached to the regulated area.

I. Eye Protection: Provide safety glasses to personnel engaged in asbestos operations when the use of a full-face respirator is not required.

J. Warning Signs and Labels: Provide warning signs in compliance with OSHA and EPA regulations at approaches to regulated areas containing airborne asbestos fibers. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.

K. Warning Signs: Provide warning signs that are of sufficient size (minimum 14 inches x 20 inches) to be clearly legible and display the following information.

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

L. Warning Labels: Provide labels of sufficient size (minimum 3 inches x 5 inches) to be clearly legible, printed in large, bold letters on a contrasting background, and displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

2.02 EQUIPMENT

A. Airless Sprayer: An airless sprayer, suitable for application of amended water and encapsulating material, shall be used.

B. Negative Air Pressure Enclosure: The negative air pressure enclosure shall be constructed of durable materials to withstand damage from rough handling. Provide high-efficiency particulate air (HEPA) Air Filtration Devices (AFDs) to provide a negative

pressure in the regulated area. The Abatement Contractor must calculate the number of AFDs sufficient to maintain a minimum of four air changes/hour, and a pressure differential of minus 0.02-inch of water column relative to adjacent, unsealed areas. One (1) additional HEPA filter-equipped AFD device must be immediately readily available for use in the enclosure in the event one of the units fails.

C. Filters: Filters on vacuums and exhaust equipment shall be UL 586 labeled HEPA filters. Each filter shall be marked with the name of manufacturer, serial number, airflow rating, efficiency and resistance and the direction of test airflow. The local exhaust system shall be operated continuously, 24 hours a day, until the regulated area enclosure is removed. Replace filters as required to maintain the efficiency of the system. The building heating, ventilating, and air-conditioning (HVAC) system shall not be used as the local exhaust system (AFD) for the regulated area. AFDs units shall be exhausted to the outside of the building, away from pedestrian ways and such that it cannot re-enter the building. The Consultant may test the exhaust devices to determine proper function.

D. Pressure Differential Monitor: Provide a system (manometer) to continuously monitor fluctuations in negative pressure, equipped with an alarm system in the event of loss of pressure differential between the inside enclosure pressure to outside air pressure.

E. Scaffolding: Scaffolding, as required to accomplish the specified Work, shall meet all applicable safety regulations.

F. Transportation Equipment: Transportation equipment, as required, shall be suitable for loading, temporary storage, transmitting, and unloading of contaminated waste without exposure to persons or property.

G. Vacuum Equipment: All vacuum equipment utilized in the work area shall utilize HEPA filtration systems.

H. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.

I. HEPA filtration units efficient to 99.97% for 0.3-micron particles.

J. Other Tools and Equipment: The CONTRACTOR shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: knives, stiff nylon brushes, sponges, rounded edge shovels, brooms, carts, and hand-held scrapers. Provide other materials, not specifically described, but required for complete and proper performance.

K. OWNER's Tools and Equipment: the CONTRACTOR shall utilize No tools or equipment of the OWNER.

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

A. General Abatement Procedures:

1. Perform asbestos removal work in accordance with 29 CFR 1926.58 and as specified herein. Use wet removal procedures. Personnel shall wear and use protective clothing and equipment as specified herein. Respiratory protection is required for all activities involving asbestos. Respiratory protection is to be initiated during the start of establishing the regulated area. Eating, smoking, drinking, chewing tobacco or chewing gum shall not be permitted in the regulated area.
2. All electrical equipment used by the CONTRACTOR in the Work Area must be protected by GFCI circuits. The electrical supply to the Work Area must be located outside the containment.
3. The Work Area is to be restricted to authorized, trained, and protected personnel only. An entry log book shall be maintained in the clean change room, and anyone who enters the Work Area must record name, affiliation, time in and time out for each entry. These may include the CONTRACTOR's employees, Environmental

Consultant, EHS, Federal, State and local inspectors and any other authorized visitors. Entry into the Work Area by unauthorized individuals shall be immediately reported to the Consultant and reported in the entry log.

4. The CONTRACTOR shall have control of site security during abatement operations, in order to protect work efforts and equipment. CONTRACTOR shall have the OWNER's assistance in notifying building occupants of impending activity and enforcement restricted access to by all employees.

3.02 PREPARATION

A. Notification:

1. Notify the OWNER in writing at least 72 hours prior to the start of any segment of ACM abatement and disposal work.
   a. With the Outage Request for each segment of ACM abatement and disposal work, include an estimate of the anticipated number of hours per day or work shifts per day required in order to complete each segment of the ACM abatement and disposal work.
2. Do not start any ACM abatement and disposal without the concurrence of the OWNER.
3. CONTRACTOR is responsible for submitting appropriate notification demolition permits and fees at least 30 days prior to starting abatement activities.
4. Ohio EPA notifications must be submitted to the appropriate agency office at least 10 working days prior to the initiation of the removal of ACM or demolition of the building.
5. Copies of Notification Forms and permit fee checks are to be submitted to the OWNER prior to mobilizing on-site.

B. Protection:

1. The CONTRACTOR shall provide protective instructions for decontamination and work procedures which are to be followed by all CONTRACTOR's personnel.
2. The CONTRACTOR shall comply with OSHA regulations for protective clothing. The CONTRACTOR shall at all times have sufficient supplies of protective clothing and supplies needed for the proper entrance/exit from the work area. Additional protective clothing is to be on site for use by the OWNER and local, state, or federal inspectors that may be on site.
3. The CONTRACTOR shall comply with OSHA regulations concerning hygiene facilities and practices. Daily inspection and disinfecting of decontamination facilities shall be provided by the CONTRACTOR.
4. The CONTRACTOR shall comply with OSHA and EPA regulations concerning signage and labeling for facility security. All entrances to the work areas shall be clearly labeled to prevent accidental entrance to a regulated area. Labeling shall include signs, stickers, and flagging as appropriate to prevent unauthorized entry to the work site. All exterior doors to the facility will be locked and secured during non-work hours.
5. The CONTRACTOR's safety rules and requirements shall be a part of the CONTRACTOR's responsibilities.

3.03 ERECTION

A. Decontamination Enclosure Systems (worker and equipment) General Requirements: Build suitable framing as described herein and as approved by the Consultant. Portable prefab units, if utilized, must be submitted for review and approval by the Consultant before starting the abatement. Submittal shall include, but not be limited to, a floor plan layout showing dimensions, materials, sizes, thickness, plumbing, and electrical outlets.

1. Construct a Workers' Decontamination Enclosure System contiguous to the Work Area consisting of three (3) totally enclosed chambers as follows:
   a. An Equipment Room with an Airlock to the Work Area and a Curtained Doorway to the Shower Room.
   b. A Shower Room with two (2) Curtained Doorways, one (1) to the Equipment Room and one (1) to the Clean Room. Plastic on Shower Room and adjoining Equipment and Clean Room shall be opaque. The Shower Room shall contain at least one (1) shower with hot and cold water. All wastewater from the shower room shall be collected and pumped through a five (5) micron filter system. Filtrate shall be disposed of as contaminated waste. From the filter, wastewater shall be drained to a sanitary wastewater system. No leakage shall be permitted.
   c. A Clean Room with one Curtained Doorway into the shower and one entrance or exit to non-contaminated areas of the building. The Clean Room shall have sufficient space for storage of the Workers' street clothes, towels, and other non-contaminated items. Joint use of this space for other functions, such as offices, storage of equipment, materials, or tools, shall be prohibited.

3.04 APPLICATION

A. Work Practices

1. The sequence of execution for each work area shall be as follows:
   a. Prepare work area.
   b. Establish load out area
   c. Pre-clean all equipment, surfaces, and piping before abatement.
   d. Remove ACMs.
   e. Remove and dispose of the contaminated waste generated by work area preparation and removal activities.
   f. Decontaminate work area and clean site.
   g. Perform visual final clearance inspection.
2. Respiratory protection shall be implemented, at a minimum, with a half-face respirator to perform the following activities:
   a. Construction of containment.
   b. Pre-cleaning activities.
   c. Removal and handling of all asbestos materials.
   d. Load out activities outside work area.
3. Air monitoring shall be conducted as required by OSHA regulations.
   a. The CONTRACTOR must perform air monitoring in the work area to comply with OSHA regulations for his employees.
   b. A complete log of all air samples and results will be submitted to the Owner at the completion of the project. It is the CONTRACTOR’s responsibility to furnish and maintain all air-monitoring equipment. The CONTRACTOR shall bear all costs in connection with air sampling and reporting under this section.
4. The CONTRACTOR shall provide a shower on-site, with hot and cold water.
5. All ACM shall be adequately wetted during all removal activities.
6. The CONTRACTOR shall provide work area isolation with the following:
   a. Only 6-mil polyethylene shall be used on this abatement project.
   b. Work area enclosures shall remain intact for the duration of the abatement project. Work area enclosures and methods shall include, but are not limited to, the following: interior critical barriers – all interior wall penetrations and

cracks shall be covered with 6-mil polyethylene. All doors within 20 feet of the work area shall be covered with 6-mil polyethylene, and proper asbestos hazard warning signs shall be posted.

7. During ACM removal, the CONTRACTOR shall comply with the following:
   a. The CONTRACTOR shall remove all identified ACM prior to the demobilization of all protective devices from the work area. The locations of identified ACM designated for removal are indicated on the Drawings and/or the Schedule herein.
   b. The work area shall be kept free of unnecessary equipment, supplies, and debris. All contaminated materials shall be properly abated, bagged and removed from the work area according to established removal methods. The CONTRACTOR shall not allow ACM to stockpile. Wrapped ACM shall not accumulate within the work area. No contaminated materials are to be stored in a sealed, secure, temporary storage trailer.
   c. The CONTRACTOR shall use amended water during all asbestos removal operations. All ACM must be thoroughly wetted prior to and during removal and shall be wetted during bagging/wrapping operations.
   d. No cutting, sawing, or grinding of any asbestos or ACMs shall be permitted. Also, no dry brushing or sweeping of asbestos or ACMs shall occur.
   e. All asbestos-containing waste being stored shall be properly labeled and bagged. Waste must be stored in a secure storage container out of the work area but inside security fence. Appropriate disposal containers for storage and transportation shall be furnished by the CONTRACTOR.
   f. High-efficiency particulate air (HEPA) filters and pre-filters shall be inspected by the CONTRACTOR on a daily basis. This includes filters on air filtration devices and HEPA-equipped vacuum cleaners. All vacuums in the work area must have and maintain HEPA attributes.
8. During ACM disposal, the CONTRACTOR shall comply with the following:
   a. All ACM must be disposed of in approved containers.
   b. All ACM wastes are to be removed from the structure and properly disposed of in a timely fashion.
   c. All ACM bagged wastes will be labeled, counted by CONTRACTOR, and be entered into daily logs.
   d. All ACM must be disposed to a licensed asbestos disposal landfill.
   e. Proper documentation of all ACM wastes generated as a result of this project must be delivered in a timely fashion.
   f. Disposal containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled in accordance with OSHA, EPA, and DOT regulations.
   g. ACM must be covered during the storage and transportation phases of the work. Shipping manifests shall be submitted as well as disposal documentation.
   h. All container(s) with asbestos waste will be stored inside the work site security fence until such time as the container is moved to the disposal site.

B. Use of Water:
1. As needed, CONTRACTOR shall provide hot and cold water for showers from a fixed head adjustable at the shower. Also, ample soap, shampoo, disinfectant and towels for use by employees as needed must be available.

2. As needed, the clean room, airlock and shower shall be disinfected daily and no accumulations of used towels, suits, street clothes and supplies shall be allowed in any decontamination unit.
3. No water shall be allowed to accumulate within the shower. All shower water must be promptly filtered through a filtration unit capable of removing particles 5.0 microns or larger. CONTRACTOR must document filter pore size and OWNER reserves the right to acquire effluent samples for analysis. In the event that analysis indicates contamination of effluent (any asbestos particles observed longer than 5.0 microns by Transmission Electron Microscopy (TEM) the CONTRACTOR shall bear the costs of all testing and shall immediately correct any problems and document that the corrections have been effective.

C. Work Area Isolation:
1. The CONTRACTOR shall demarcate the work area including barrier tape and signage prior to removal in accordance with all applicable laws and regulations.
2. Electrical extension cords shall be suspended wherever feasible.
3. Emergency exits shall be clearly labeled and shall be constructed so as to provide easy exit from the containment in event of an emergency. Red signs shall be used to denote the locations of emergency exits, fire extinguishers and hazardous areas within the work area. CONTRACTOR's employees shall be trained in emergency procedures.
4. Respiratory protection is required for all activities involving asbestos. Respiratory protection is to be initiated during the start of work area isolation.

D. Personnel and Facility Protection:
1. Protection Instruction: The CONTRACTOR shall provide decontamination and work procedures to be followed by the workers.
2. Protective Clothing: The CONTRACTOR shall comply with OSHA regulations for protective clothing. The CONTRACTOR shall at all times have sufficient supplies of protective clothing and supplies needed for the proper entrance/exit from the work area. Protective clothing shall be of a color that will not attract attention or alarm bystanders. An acceptable color is blue.
3. Hygiene Facilities and Practices: The CONTRACTOR shall comply with OSHA regulations concerning hygiene facilities and practices. Daily inspection and disinfecting of decontamination facilities shall be conducted by the CONTRACTOR.
4. Emergency Precautions: Prepare a contingency plan for emergencies including fire, accident, power failure, negative pressure system failure, supplied air system failure, or all other events that may require modification or abridgment of decontamination or work area isolation procedures. Include a plan specific procedure for decontamination or work area isolation. Note that nothing in this plan shall impede safe exiting or providing of adequate medical attention in the event of an emergency.
5. Facility Security: The CONTRACTOR shall comply with OSHA and EPA regulations concerning signage and labeling. All entrances to the work areas shall be clearly labeled to prevent accidental entrance to a regulated area. Labeling shall include signs, stickers and flagging as appropriate to prevent unauthorized entry to the work site.

E. Disposal:
1. Disposal containers shall be suitable to receive, secure and retain all asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled in accordance with OSHA, EPA and Department of Transportation (DOT) regulations. Containers must be airtight and watertight. Shipping manifests shall be submitted to OWNER as well as disposal documentation.

2. Disposal of all waste ACM generated from this project shall be properly documented. Detailed disposal documents including information concerning amounts of material, generator information, hauler information, date of generation, and disposal documentation must be processed for all material disposed of as contaminated wastes.
3. All bagged contaminated materials must be sufficiently wetted, sealed in airtight containers, and at a minimum must be sealed within two 6-mil polyethylene bags (one sealed inside the other). No rips or tears shall be visible in the bags, no material may be protruding through the polyethylene, and no visible residue may be visible outside of a container. CONTRACTOR shall wash all inner, as well as outer, bags of ACM.
4. All asbestos disposal containers must be labeled with the current hazardous warning labels and DOT information. The CONTRACTOR shall label the inner and outer asbestos bag or container.
5. All ACM waste bags shall be removed from the work area prior to leaving each shift and transferred to the secured storage container prior to leaving the work site. All ACM waste bags shall be transferred through the regulated area through the decontamination unit.
6. All ACM wastes must be transported in a closed vehicle. The driver compartment must be separated from the cargo compartment. The cargo compartment must be lined with 6-mil polyethylene which is to be removed at the dump and disposed of as contaminated.
7. The cargo compartment of the disposal vehicle must be cleaned between loads. Cleaning shall include washing, wet-wiping and HEPA vacuuming.
8. Large steel dumpsters (roll-off type) may be used for asbestos waste disposal. These shall be lined with polyethylene and shall have doors, tops, or covers that can be closed and locked to prevent vandalism or other disturbance of the containerized asbestos debris and wind dispersion of asbestos fibers. Un-containerized asbestos materials shall not be placed in these type dumpsters, nor shall they be used for non-asbestos waste. Bags shall be placed, not thrown, into these containers to avoid splitting.

F. Cleaning of Work Area:

1. All HEPA filtration devices shall continue to operate during cleaning of the work area. All vacuums inside work area shall utilize HEPA filtration.
2. All unnecessary equipment, tools, devices and supplies shall be properly cleaned and removed from the work area via the equipment decontamination unit.
3. Cleaning shall start by wetting all surfaces within the work area with clean water. Surfaces shall be wetted from top to bottom.
4. Removal of ACM residue shall be accomplished with the use of nylon-bristle brushes, nylon scouring pads, towels, sponges, stiff scrapers, and HEPA-equipped vacuums. The use of brushes with wire bristles and the technique of dry brushing ACM residue are strictly prohibited.
5. After all residue of ACM has been removed, the surfaces shall be cleaned with clear water and wiped with a clean disposable towel. Each towel shall be used only once and then disposed. Rinse water is to be changed frequently.
6. Disposable cloths are to be used during final cleaning procedures. Cloths shall be used only once and disposed. Rinse water shall be changed frequently.
7. All liquids sprayed within the work area shall be delivered through an airless sprayer. (Spraying with garden hoses and pressurized sprayers is prohibited).
8. A visual inspection of all surfaces previously containing ACM will be conducted. All surfaces must have been cleaned thoroughly so no debris or residue remains.

3.05 REPAIR/RESTORATION

A. The CONTRACTOR shall be responsible for providing all such minor repairs, patches and cover plates, whether specifically shown or described or not.

1. Repair damage done to facilities to remain, or to any property belonging to the OWNER.

3.06 FIELD QUALITY CONTROL

A. Air Monitoring: Monitoring of airborne concentrations of asbestos fibers shall be in accordance with 29 CFR 1926.58 and as specified herein. The OWNER shall have the option to perform independent monitoring:

1. The CONTRACTOR must provide personal air monitoring in accordance with OSHA asbestos standard for the construction industry (29 CFR 1929.1101), and shall be performed as often as is necessary to determine an 8-hour time-weighted average exposures and ceiling concentration for workers operating both in and out of the work area.
2. The CONTRACTOR shall keep a log of all monitoring activities performed. A complete log of all air samples and results will be submitted at the completion of the Project. It is the CONTRACTOR's responsibility to furnish and maintain all air monitoring equipment. The CONTRACTOR shall bear all costs in connection with air sampling and reporting under this section.
3. The OWNER reserves the right to procure personal air samples of the CONTRACTOR's employees to measure worker exposure levels and the CONTRACTOR will cooperate with such monitoring activities.

B. Air Monitoring of the Work Area:

1. The OWNER will perform air monitoring outside of and adjacent to the work areas. If these measurements indicate levels of contamination in excess of 0.01 fibers/cc outside the work area from asbestos hazard abatement work, the CONTRACTOR shall immediately cease operation until the presence of contamination is verified and the cause of contamination is identified and corrected, if necessary, to the satisfaction of the OWNER. This correction may involve establishing more stringent enclosure requirements. The CONTRACTOR shall resume asbestos operations only after it receives written authorization from the OWNER.
2. The CONTRACTOR shall facilitate and cooperate fully with air monitoring and shall take no action intended to distort or falsify measurements of fiber concentrations and shall not take any action to obstruct these air-monitoring activities.
3. All sampling and analytical work shall conform with OSHA Reference Method (ORM), National Institute for Occupational Safety and Health (NIOSH) Method 7400 (A Rules) or by Asbestos Hazard Emergency Response Act (AHERA) specified clearance procedures.

C. Air Sampling:

1. At the completion of each segment, or as otherwise specified, the OWNER may procure air samples within the work area(s) for clearance by Phase Contrast Microscopy (PCM) analysis. If the analysis indicates that the concentration of asbestos fibers in these samples exceeds clearance levels (0.01 fibers per cubic centimeter), the CONTRACTOR shall continue to air and surface clean the work area until air monitoring indicates asbestos concentrations have fallen below the appropriate limit. In the event a final clearance test fails, the CONTRACTOR will bear the costs associated with further testing and cleaning until the area passes clearance testing.

D. OWNER's Inspection.

1. The OWNER may conduct daily inspections regarding work area isolation structures, decontamination facilities, and protective coverings; worker protection

program; CONTRACTOR's air-monitoring program; proper performance of asbestos hazard abatement work including work area preparation and isolation, stripping, removal, encapsulation, and disposal; conformance with State of Ohio, EPA, OSHA, Department of Transportation (DOT), and other regulations; and conformance with these Specifications.

E. Verification of Removal of ACM

1. The CONTRACTOR shall inform the OWNER upon completion of the ACM abatement prior to the demobilization of all protective devices from the work area.
2. The OWNER shall inspect all ACM abatement locations within each building and verify the removal of all identified ACM prior to the demobilization of all protective devices from the work area.

3.07 CLEANING

A. Cleaning of Work Area.

1. Disposable cloths are to be used for final cleaning procedures. Cloths are to be used only once and disposed of as asbestos containing Final Clearance/Cleaning Procedures.
2. The following cleanup sequence shall be utilized for this asbestos removal project:
   a. Perform a gross removal visual inspection of all surfaces previously containing ACM. The CONTRACTOR's "designated or competent person" shall accompany the OWNER on the visual inspection. No debris shall remain.
   b. Perform a cleaning visual inspection of the work area to ensure that all surfaces are clean and free of debris. All ACMs must be visually non-detectable. CONTRACTOR's "designated or competent person" must accompany the OWNER.
   c. Final air sampling is required for any building area that will be re-occupied. Final air sampling is not required in the event of demolition of the building.
   d. Upon completion of the visual inspection verifying that the ACMs are removed and disposed by procedures that meet specifications, the CONTRACTOR shall remove all polyethylene barriers, equipment, air filtration devices, and any supplies or materials from the work area.

END OF SECTION

SECTION 02 83 00
LEAD, CADMIUM, CHROMIUM AND ARSENIC COATINGS IN CONSTRUCTION

PART 1 GENERAL

1.1 SUMMARY

A. The CONTRACTOR is responsible for the coordination of the Work of this Section with related Work. No delays in completion of the work shall be claimed for lack of coordination.

B. The CONTRACTOR shall comply with all applicable local, state, and federal guidelines and regulations regarding all work involving the presence of lead/cadmium/chromium/arsenic coatings.

C. The Work of this Section specifies minimum requirements for the disturbance, removal, containment, and disposal of lead, cadmium, chromium and/or arsenic coatings and associated waste generated as a result of demolition and coatings removal activities at the site as follows:
1. For coatings removal where use of blasting, torch cutting or welding is required to remove metal components, the CONTRACTOR performing the torch cutting or welding must be trained under the OSHA Standard 29 CFR 1926.62 (lead), 29 CFR 1926.1127 (cadmium), 29 CFR 1926.1126 (chromium) and 29 CFR 1926.1018 (arsenic).
2. Removal of coatings from demolished piping and equipment is not required if piping or equipment can be removed without disturbing coatings and disposed of in a manner complying with all applicable local, state, and federal guidelines and regulations

D. Refer to the Hazardous Materials Survey report, to be kept on-site.

E. Testing for lead paint has been performed, and the following surfaces were confirmed to contain lead paint.

TABLE 1 – SURFACES WITH LEAD PAINT

Location	Lead-based Paint and Surfaces
Office Building/Garage	• Red tire rack • Dark gray and red I-beams and columns • Brown fire cabinet • White main switch panel • Red/orange exterior bollards
Salt Building (Dome)	• No lead-based paint identified
Sand/Salt Building	• Brown I-beams and columns
Mobile Trailer	• No lead-based paint identified
Pole Barn	• Gray plywood storage bin
Small Pump Structure	• No lead-based paint identified

F. Testing for cadmium coating has been performed on a representative number of painted components in the areas scheduled for paint removal and demolition. The following surfaces were identified to contain cadmium coatings.

TABLE 2 – SURFACES WITH CADMIUM COATING

Location	Cadmium Coating and Surfaces
Office Building/Garage	• No cadmium coatings identified
Salt Building (Dome)	• No cadmium coatings identified
Sand/Salt Building	• No cadmium coatings identified
Mobile Trailer	• No cadmium coatings identified
Pole Barn	• No cadmium coatings identified
Small Pump Structure	• No cadmium coatings identified

G. Testing for chromium coating has been performed on a representative number of painted components in the areas scheduled for paint removal and demolition. The following surfaces were confirmed to contain chromium coatings:

TABLE 3 – SURFACES WITH CHROMIUM COATING

Location	Chromium Coating and Surfaces
Office Building/Garage	• Brown window frames • Brown picnic table • Brown, tan and cream doors • Gray and green cement floors • Gray CMU walls • Green wood work station • Red tire rack • Dark gray and red I-beams and columns • Brown metal file cabinet • Brown exterior piping • Gray overhead garage doors • White downspouts
Salt Building (Dome)	• No chromium coatings identified
Sand/Salt Building	• Brown I-beams and columns
Mobile Trailer	• Taupe aluminum siding • White aluminum trim • Dark brown window frames • Tan aluminum trailer skirt • White doors
Pole Barn	• White downspouts • Tan and gray aluminum siding • Brown plank wall
Small Pump Structure	• Dark blue pump motor

H. Testing for arsenic coating has been performed on a representative number of painted components in the areas scheduled for paint removal and demolition. The following surfaces designated for demolition were confirmed to contain arsenic coatings.

TABLE 4 – SURFACES WITH ARSENIC COATING

Location	Arsenic Coating and Surfaces
Office Building/Garage	• Tan, gray, green, red, black and white CMU walls • Tan drywall walls • Blue, brown, gray, green and cream doors • Brown/tan/white window and door frames • Brown picnic table • Gray and green concrete floor • White heater unit • Red vehicle lift • Green wood work station • Yellow striping paint • Dark gray staircase • Gray pipe insulation • Blue pump valve • Brown exterior piping
Salt Building (Dome)	• No arsenic coatings identified
Sand/Salt Building	• No arsenic coatings identified
Mobile Trailer	• Taupe aluminum siding • Dark brown window frames • White drywall ceiling • Brown door trim
Pole Barn	• White plywood walls • Gray storage bin • Brown plank wall
Small Pump Structure	• Black hydraulic tank • White heater unit

I. The procedures described herein shall provide work practice requirements where occupational exposure to lead, cadmium, and/or chromium is present, and shall provide requirements regarding waste testing and disposal of all wastes generated from the work described in this section. The CONTRACTOR shall assume that any coated surface for which representative test results are not available contains lead/cadmium/ chromium coatings, and it shall be the CONTRACTOR's responsibility to protect workers performing under this Contract.

J. The CONTRACTOR shall assume full responsibility and liability for the compliance with all applicable Federal, State and local regulations pertaining to work practices, hauling and disposal of hazardous waste, protection of workers and visitors to the site, and persons occupying areas adjacent to the site. The CONTRACTOR shall hold the OWNER harmless for failure to comply with any applicable work, hauling, disposal, safety, health or regulation on the part of himself, his workers or his Subcontractors.

K. The CONTRACTOR is required to ensure the protection of workers performing any work that will affect surfaces coated with lead/cadmium/chromium/arsenic paint as well as protecting the public and the environment from exposure to lead/cadmium/chromium/ arsenic dust.

1.2 REFERENCES

A. All work shall conform to the standards set by applicable Federal, State and local laws, regulations, ordinances, and guidelines in such form in which they exist at the time of the work on the Contract and as may be required by subsequent regulations.

B. In addition to any detailed requirements of the Specification, the CONTRACTOR shall at his own cost and expense comply with all laws, ordinances, rules and regulations of Federal, State, Regional and Local Authorities regarding handling and storing of lead, cadmium, and/or chromium waste material.

C. Reference Standards:
   1. Code of Federal Regulations (CFR) Publications:
      a. 29 CFR 1926.21 – Safety Training and Education (OSHA)
      b. 29 CFR 1926.59 – Hazard Communication (OSHA)
      c. 29 CFR 1926.62 – Lead in Construction (OSHA)
      d. 29 CFR 1926.1127 – Cadmium in Construction (OSHA)
      e. 29 CFR 1926.1126 – Chromium in Construction (OSHA)
      f. 29 CFR 1926.1018 – Arsenic in Construction (OSHA)
      g. 40 CFR 50 - National Primary and Secondary Ambient Air Quality Standards for Lead (EPA)
   2. Ohio Revised Code (ORC) 3742 – Lead Abatement
   3. National Institute of Occupational Safety and Health (NIOSH) Publications
   4. American Industrial Hygiene Association (AIHA)

D. All regulations by the above and other governing agencies in their most current version are applicable throughout this project. Where there is a conflict between this Specification and the cited State, Federal, or local regulations, the more restrictive or stringent requirements shall prevail.

THIS SECTION REFERS TO MANY REQUIREMENTS FOUND IN THESE REFERENCES, BUT IN NO WAY IS IT INTENDED TO CITE OR REITERATE ALL PROVISIONS THEREIN OR ELSEWHERE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO KNOW, UNDERSTAND, AND ABIDE BY ALL SUCH REGULATIONS AND COMMON PRACTICES.

1.3 DEFINITIONS

A. Action Level: Employee exposure, without regard to the use of respirators to an airborne concentration of lead of 30 micrograms/cubic meter (μ/m^3) calculated as an 8-hour time-weighted average (TWA).

B. Area Monitoring: Sampling of lead concentrations within the work area and outside the work area that is representative of the airborne concentrations of lead.

C. Encapsulant: Barrier formed using a liquid-applied coating or an adhesively bonded covering material.

D. HEPA Filter Equipment: High efficiency particulate air- (HEPA) filtered vacuuming or exhaust ventilation equipment with a UL 586 filter system. Filters shall be of 99.97 percent efficiency for retaining 0.3-micrometer diameter particles.

E. Lead Paint: Paint, varnish, coating, or stain that contains lead in excess of 0.0% lead by weight.

F. Sample Location: Area or place where an air sample is collected.

G. Time Weighted Average (TWA): The TWA is an 8-hour time-weighted average for the test of the concentration of lead for worker exposure.

H. Toxicity Characteristic Leaching Procedure (TCLP): The EPA required sample preparation for determining the hazard characteristic(s) of a waste.

I. Work Area: A controlled-access work area that has plastic sheeting or other containment barriers erected to separate the trades and the public from entering.

1.4 SYSTEM DESCRIPTION

Not Used

1.5 SUBMITTALS

A. Submit the following prior to commencement of the project:

1. Copies of all notifications, permits, applications, licenses and like documents required by Federal, State, or local regulations and this specification obtained or submitted in proper fashion.
2. List of total number of supervisors and workers intended to be assigned to the project, including name and lead awareness qualifications.
3. Copies of written medical opinions for each employee who may be occupationally exposed to lead/cadmium/chromium as required by 29 CFR 1926.62 (lead), 29 CFR 1926.1127 (cadmium), 29 CFR 1926.1126 (chromium) and 29 CFR 1926.1018 (arsenic).
4. Record of successful respirator fit testing performed by a qualified individual within the previous 12 months for each employee to be used on this project with the employee's name and last 4 digits of the social security number with each record.
5. Employer's Lead Compliance Program as required by 29 CFR 1926.62, including proposed worker training, respiratory protection program and medical monitoring for all employees throughout all phases of the job, including make, model and NIOSH approval numbers of respirators to be used, worker orientation plan, written description of all proposed procedures, methods, or equipment to be utilized, including those that may differ from the Contract Specifications. In all instances, CONTRACTOR must comply with all applicable federal, state and local regulations.
6. Safety Data Sheets (SDS) on potentially hazardous materials to be used on the project.
7. The CONTRACTOR shall determine the 8-hour Time Weighted Average (TWA) exposure for each employee on the basis of any combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize employee exposure to lead/cadmium/chromium/arsenic.
8. Waste Disposal Plan which describes the waste stream and the disposal means (i.e. landfill, recycle, etc.) and includes the name, address, and ID number of the proposed hazardous waste hauler, waste transfer route, and proposed disposal reclamation or treatment facility.
9. Work Plan which describes proposed engineering controls, work practices and procedures, and sequencing that the CONTRACTOR will use to conduct the work of this specification and related Sections. Upon Contract award, the CONTRACTOR shall submit a more specific plan prior to commencement to work.
10. Name, address, certification and experience of AIHA-accredited lab.
11. Schedule of work.
12. NOTE: No work of the project will be allowed to begin until OWNER accepts the required submittals. Any delay caused by the CONTRACTOR's refusal to submit this documentation in a timely fashion does not constitute a claim for extra compensation or a time extension.

B. Submit the following to the OWNER as a Post-Construction submittal package:

1. Copies of waste manifests and receipts acknowledging disposal and recycling of all waste material from the project, showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
2. All personnel monitoring results as detailed in paragraph 3.14 of this Section.
3. All Toxicity Characteristic Leachate Procedure (TCLP) testing results for waste disposal purposes.

C. The CONTRACTOR shall determine the 8-hour Time Weighted Average (TWA) exposure for each employee on the basis of any combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize employee exposure to lead/cadmium/chromium/arsenic.

1.6 QUALITY ASSURANCE

Not Used

1.7 DELIVERY, STORAGE, AND HANDLING

A. At no time will OWNER permit storage of debris generated from paint removal activities to accumulate on the bare ground or be stored inside buildings at the site, and any storage of materials shall be subject to OWNER'S approval. Assure security of debris at all times. Toxic dust and particles from the paint removal process may contaminate on-site soils if not properly contained.

B. Work Affected: In general, the following activities are minimum requirements of this Section and affect the renovation performed on the painted components:
1. No demolition, torch cutting, mechanical sanding or stripping, or abrasive methods of paint removal shall occur until the employer performs an employee exposure assessment as required under 29 CFR 1926.62, 29 CFR 1926.1127, and 29 CFR 1926.1126, and determines actual employee exposure. The employer shall provide to employees performing these tasks with interim protection as follows and according to 29 CFR 1926.62, 29 CFR 1926.1127, 29 CFR 1926.1126, 29 CFR 1926.1018:
   a. Appropriate respiratory protection
   b. Appropriate personal protective clothing and equipment
   c. Change areas
   d. Hand washing facilities
   e. Biological monitoring to consist of blood sampling and analysis for cadmium, chromium, lead and zinc protoporphyrin levels
   f. Training as required regarding 29 CFR 1926.59, Hazard Communication; training as required regarding use of respirators; and training in accordance with 29 CFR 1926.21, Safety training and education.
2. Workers shall be informed of the components to be impacted during renovation that have been identified as containing lead, cadmium, chromium, and/or arsenic.
3. Separation of Trades: Unprotected, untrained workers or trades shall not perform any related work within the same vicinity as work involving components identified with lead/cadmium/chromium/arsenic.

C. Waste Disposal
1. The CONTRACTOR shall comply with the Resource Conservation and Recovery ACT (RCRA) and with all applicable state and local regulations.
2. As of December 21, 2017, Ohio EPA's Ohio-Specific Universal Waste rules allow hazardous paint-related waste to be classified as a universal waste in Ohio under OAC Chapter 3745-273. With the current regulations, quantities of hazardous paint-related waste does not count towards small or large quantity hazardous waste generator status. However, hazardous paint-related waste must be managed and transported under small or large quantity handler of universal waste status.

3. A Small Quantity Handler of Universal Waste (SQHUW) may store less than 5000 kg of UW at any time and a Large Quantity Handler of Universal Waste (LQHUW) may store 5000 kg or more of UW. The handler's management activities are limited to those specified in OAC rule 3745-273-13 for SQHUW and OAC rule 3745-273- 33 for LQHUW. A Universal Waste Transporter must transport the waste in accordance with all U.S. DOT requirements.
4. For disposal purposes, hazardous paint-related waste must still be classified as hazardous or non-hazardous. CONTRACTOR shall be responsible for disposing of all waste determined by Toxicity Characteristic Leachate Procedure (TCLP) to be hazardous. If TCLP testing has not been performed, the CONTRACTOR shall be responsible for testing the waste.
5. CONTRACTOR shall be responsible for disposing of all waste determined by Toxicity Characteristic Leachate Procedure (TCLP) to be hazardous. If TCLP testing has not been performed, the CONTRACTOR shall be responsible for testing the waste.

D. CONTRACTOR shall comply with all EPA regulations.

1.8 PROJECT CONDITIONS

Not Used

1.9 SEQUENCING

A. Notifications: Provide in proper and timely fashion, all necessary notifications to relevant federal, state, and local authorities and obtain and comply with provisions of all permits or applications required by the work specified, as well as make all required submittals required under those auspices. CONTRACTOR shall indemnify OWNER from, and pay for all claims resulting from failure to adhere to these provisions. Costs for all permits and applications are to be assumed by CONTRACTOR.

B. Work shall be carried out in sequential phases. As a Contract requirement, any reasonable delay caused by this requirement will not constitute a basis for claim against the OWNER. CONTRACTOR must coordinate the work of this Section with the work of all other trades.

C. Extend full cooperation to OWNER in all matters involving the use of OWNER's facilities. At no time shall CONTRACTOR cause or allow to be caused conditions that may cause risk or hazard to the general public or conditions that might impair safe use of the facility. The use of the facility's electricity, water or like utilities by the CONTRACTOR shall be as outlined in these specifications.

D. Coordinate the work of this Section with that of all other related Sections and trades.

E. Unless specifically authorized by the OWNER, the work of this project shall be conducted in accordance with the working hours agreed upon in the Contract.

F. Inspections: The OWNER may perform visual inspections during the work of this section, as described below:
1. During: Prior to the commencement of a proposed alternative method other than specified.
2. Post Inspection: At the completion of work and final clean-up, prior to clearance or removal of any critical barriers from the work area and release to other trades.
3. Waste Removal Inspection: Prior to removal of hazardous waste from the site, OWNER may inspect the quantity and type.

1.10 SCHEDULING

A. The CONTRACTOR shall coordinate all scheduling with the OWNER. A schedule of work shall be submitted to the OWNER prior to contract performance

1.11 WARRANTY
Not Used

1.12 SYSTEM STARTUP
Not Used

1.13 INSTRUCTION OF OWNER'S PERSONNEL
Not Used

1.14 COMMISSIONING
Not Used

1.15 MAINTENANCE
Not Used

PART 2 PRODUCTS

2.1 MANUFACTURERS
Not Used

2.2 EXISTING PRODUCTS
Not Used

2.3 MATERIALS

A. All material and equipment proposed to be used on this project shall be subject to the acceptance of the OWNER.
1. Polyethylene sheeting, minimum thickness of 6-mil, fire retardant
2. Plastic bags, minimum thickness of 6-mil
3. High quality duct tape
4. Lead Warning Signs, as described in OSHA
5. Spray adhesive, fire retardant
6. Personal Protective Equipment, NIOSH approved respirators and filters
7. HEPA vacuums
8. Trisodium-Phosphate (TSP), product data
9. Other materials, tools and equipment necessary for lead based paint abatement
10. Cloth Tarpaulins
11. Chemical Strippers, where applicable, not containing methylene chloride and/or flammable materials
12. Encapsulants
13. Blasting media

2.4 MANUFACTURED UNITS
Not Used

2.5 EQUIPMENT
Not Used

2.6 COMPONENTS
Not Used

2.7 ACCESSORIES
Not Used

2.8 MIXES
Not Used

2.9 FABRICATION
Not Used

2.10 FINISHES
Not Used

2.11 SOURCE QUALITY CONTROL
Not Used

PART 3 EXECUTION

3.1 ACCEPTABLE INSTALLERS
Not Used

3.2 EXAMINATION

A. Identification of Hazards:
   1. Prior to any work involving lead/cadmium/chromium/arsenic-containing items, the CONTRACTOR shall identify all work activities in which a worker may be occupationally exposed to lead/cadmium/chromium/arsenic.
   2. The CONTRACTOR shall initially determine if any worker may be exposed to lead/cadmium/chromium above the action level as required by 29 CFR 1926.62, 29 CFR 1926.1127, 29 CFR 1926.1126, and 29 CFR 1926.1018.

3.3 PREPARATION

A. Barriers and Isolation Areas:
   1. Containment controls (including critical barriers, protective coverings, HEPA-filtered ventilation and decontamination facilities) will be required for all coatings removal work and areas where torch cutting/welding will be performed without prior coatings removal. The degree of containment shall be appropriate for the anticipated levels of airborne lead/cadmium/chromium/arsenic dust. The lower the level of airborne lead/cadmium/chromium/arsenic, the lesser the requirements necessary to control emissions at the job site.
   2. Work Area Isolation:
      a. The CONTRACTOR shall isolate work areas for the duration of work by completely sealing off all openings in the work area. Isolation shall be accomplished by constructing critical barriers where necessary around the work area perimeter. The work area shall be sealed airtight to the greatest extent possible.
      b. Provide temporary power and lighting (with ground fault circuit interrupt protection) to the work areas, and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements, and OSHA requirements for temporary lighting in the environment normal to renovation areas.
      c. All work areas involving lead/cadmium/chromium/arsenic shall remain isolated from all other trades on the project and remain inaccessible to the public. CONTRACTOR shall monitor the access to the renovation work areas. The below listed items are <u>required</u> to control the generation of dust during renovation activities. The CONTRACTOR is ultimately responsible for cleaning all generated dust and paint debris from

renovation operations and must maintain work areas free from lead/cadmium/chromium/arsenic dust generated from renovation activities.

1) Signs shall be posted at all approaches to the immediate work area warning that work involving lead/cadmium/chromium/ arsenic is being conducted in the immediate vicinity. Signs shall be in bold lettering not smaller than 2 inches tall.
2) Barriers shall not be removed until the work areas are thoroughly cleaned.

B. Comply with all requirements for release of work areas as described in the project specification.

C. It is the prerogative of the OWNER to inspect whenever deemed necessary and the CONTRACTOR is responsible for meeting and correcting any deficiencies discovered which do not meet the current applicable regulations and requirements of these specifications.

3.4 ERECTION

Not Used

3.5 INSTALLATION

Not Used

3.6 APPLICATION

A. Work Procedures
1. The CONTRACTOR shall initiate, and continue, sufficient engineering and work practice controls, as described in the CONTRACTOR's Lead Compliance Program, to reduce and maintain worker exposures to lead at or below the action level.
2. The following work practices are specifically required by these specifications:
a. All persons except those directly involved in the work shall be excluded from the work area. Physical barriers shall be used, where necessary, to limit access to the work area for the duration of the demolition operations.
b. Provide hand-washing and/or shower facilities and ensure that all workers thoroughly wash their hands and face upon exiting the work area. Workers shall pay careful attention to cleanse the hands and face when decontaminating.
c. All equipment used by the workers inside the work area shall be either left in the work area or thoroughly decontaminated before being removed from the area. Extra work clothing (in addition to the disposable suits supplied by the CONTRACTOR) shall be left in the clean area until the completion of work in that area. The clean area shall be cleaned of all visible debris and disposable materials daily.
3. Under no circumstances shall workers or supervisory personnel eat, drink, smoke, chew gum, or chew tobacco in the work area; to do so shall be grounds for the OWNER to stop all renovation operations. Only in the case of life-threatening emergency shall workers or supervisory personnel be allowed to remove their protective respirators, if applicable, while in the work area. In this situation, respirators are to be removed for as short a duration as possible.

3.7 CONSTRUCTION

A. Hazardous Coatings Removal or Demolition:
1. Utilize wet methods to manually remove lead/cadmium/ chromium/arsenic-containing materials. The debris generated must be maintained in a wetted state

throughout the removal process to eliminate all visible dust emissions. Any waste water generated during demolition activities shall be filtered through a 5-micron filter prior to discharging to sanitary sewer system.

2. The use of power tools or vacuums that are not equipped with HEPA-filters is strictly prohibited.
3. Wall and ceiling demolition shall include the removal of plaster, concrete and/or drywall. The CONTRACTOR shall take down the walls in intact pieces as large as practical to reduce the amount of dust released during demolition.
4. Coatings removal shall follow the requirements listed below:
   a. Coatings removal shall be performed to remove all visible paint down to bare substrate steel whenever the CONTRACTOR performing the cutting, torching, or welding is not trained according to 29 CFR 1926.62. The removal area shall be at least 4 inches wide on either side of the cut line.
   b. No torch cutting, mechanical sanding or stripping, or abrasive methods of paint removal shall occur until the employer performs an employee exposure assessment as required under 29 CFR 1926.62 and determines actual employee exposure. The employer shall provide to employees performing these tasks with interim protection as follows and according to 29 CFR 1926.62:
      1) Appropriate respiratory protection
      2) Appropriate personal protective clothing and equipment
      3) Change areas
      4) Hand washing facilities
      5) Biological monitoring to consist of blood sampling and analysis for arsenic, cadmium, chromium, lead and zinc protoporphyrin levels
      6) Training as required regarding 29 CFR 1926.59, Hazard Communication; training as required regarding use of respirators; and training in accordance with 29 CFR 1926.21, Safety training and education.
5. All paint chips, slurry, waste, and debris generated from paint removal shall be removed immediately upon generation during the work.

B. Demolition and coatings removal shall occur only when proper barriers and protection are in place and per the approved work plan regarding barrier set-up of coatings removal. Maintain the work Site in a neat and orderly manner at all times, so as not to interrupt or infringe upon the work of other trades.

3.8 REPAIR/RESTORATION
Not Used

3.9 RE-INSTALLATION
Not Used

3.10 FIELD QUALITY CONTROL
Not Used

3.11 ADJUSTING
Not Used

3.12 CLEANING

A. Maintain the work site in a neat and orderly manner at all times, so as not to interrupt or infringe upon the work of other trades.

B. Comply with all requirements for release of work areas as described in the project specification.

C. It is the prerogative of the OWNER to inspect whenever deemed necessary and the CONTRACTOR is responsible for meeting and correcting any deficiencies discovered which do not meet the current applicable regulations and requirements of these specifications.

D. Storage of Waste:
   1. Use of waste containers on site shall be controlled under the following requirements:
      a. Location of waste containers on site shall be coordinated with the OWNER.
      b. Waste containers shall be lined with 2 layers of 6-mil polyethylene sheeting, be solid, enclosed containers, locked and sealed at all times. This requirement applies to waste classified as hazardous based on TCLP testing.
      c. CONTRACTOR shall comply with all federal, state, and local regulations and ordinances regarding lead/cadmium/chromium/arsenic waste and recyclable storage.

E. The CONTRACTOR shall be responsible for disposing of all waste determined by Toxicity Characteristic Leaching Procedure (TCLP) to be hazardous. If TCLP testing has not been performed, the CONTRACTOR shall be responsible for testing the waste.

F. The CONTRACTOR shall comply with the EPA regulations, including the Resource Conservation and Recovery ACT (RCRA), and with all applicable state and local regulations.

3.13 DEMONSTRATION

Not Used

3.14 PROTECTION

A. Personnel Sampling – CONTRACTOR:
   1. Perform personnel air sampling during all renovation and demolition work to determine worker exposure limits. The results of such sampling shall be posted, provided to individual workers, and submitted to the OWNER as described in paragraph 1.05 of this Section.
   2. Provide sampling to check personal exposure levels. Representative sampling shall be taken for the duration of the work shift or for 8 hours, whichever is less. Personal samples need not be taken for repeated working conditions if working conditions remain unchanged, but must be taken every time there is a change in the removal operation, either in terms of the location or the type of work. Sampling will be used to determine 8-hour Time-Weighted-Averages (TWA). Personal sampling shall be as outlined in OSHA Standard 29 CFR 1926.62.
   3. Air sampling results shall be transmitted to the OWNER and individual workers available at the job site in written form no more than 48 hours after the completion of a sampling cycle. The reporting document shall list each sample's result, sampling time and date, personnel monitored, flow rate, sample duration, sample yield, cassette size, and analyst’s name and company, and shall include

an interpretation of the results. Air sample analysis results will be reported in micrograms/cubic meter (µg/m^3).

4. The CONTRACTOR'S testing lab shall be AIHA accredited for analysis of metals. CONTRACTOR shall submit for OWNER's review and acceptance the name and address of the laboratory, certification(s) of AIHA accreditation for metal analysis, listing of relevant experience in air lead analysis, and presentation of a documented Quality Assurance and Quality Control program.
5. Air monitoring frequency will be established in accordance with the requirements set forth in 29 CFR 1926.62.

B. Authority to Stop Work:

1. The OWNER has the authority to stop the work at any time it is determined that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of the OWNER. Standby time required to resolve violations shall be at the CONTRACTOR's expense, and shall not be cause for extending the completion date.

C. Emergency Precautions

1. The CONTRACTOR shall establish emergency and fire exits from the work area.
2. When an injury occurs, the CONTRACTOR shall stop work until the injured person has been removed from the work area.

3.15 SCHEDULES

Not Used

END OF SECTION

SECTION 033000 - CAST-IN-PLACE CONCRETEGENERAL

1.1 SUMMARY

A. Section Includes:

1. Form-facing material for cast-in-place concrete.
2. Concrete standards.
3. Concrete materials.
4. Admixtures.
5. Steel reinforcement
6. Vapor retarders.
7. Floor and slab treatments.
8. Liquid floor treatments.
9. Curing materials.
10. Accessories.
11. Repair materials.
12. Concrete mixture materials.
13. Concrete mixture class types.
14. Concrete mixing.

B. Related Requirements:
1. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.2 DEFINITIONS

A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.

B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

C. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:

1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

D. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Exposed surface form-facing material.
2. Portland cement.
3. Blended hydraulic cement.
4. Performance-based hydraulic cement.
5. Fly ash.
6. Slag cement.
7. Silica Fume
8. Natural or other pozzolans.
9. Aggregates.
10. Admixtures:

    a. Include limitations of use. Admixtures that do not comply with reference ASTM International requirements must be submitted with test data for approval.
11. Vapor retarders.
12. Floor and slab treatments.
13. Liquid floor treatments.
14. Curing materials.
15. Joint fillers.
16. Repair materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Compressive strength at 28 days or other age as specified.
3. Durability exposure classes for Exposure Categories F, S, W, and C.
4. Maximum w/cm ratio.
5. Air content.
6. Nominal maximum aggregate size.
7. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

    a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each class of concrete indicated in "Concrete Mixture Class Types" Article, including the following:

1. Concrete class designation.
2. Location within Project.
3. Exposure class designation.
4. Formed surface finish designation and final finish.
5. Final finish for floors.
6. Floor treatment, if any.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.

B. Material Certificates: For each of the following:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following:

1. Portland cement.
2. Blended hydraulic cement.
3. Performance-based hydraulic cement.
4. Steel reinforcement.
5. Fly ash.
6. Slag cement.
7. Silica Fume.
8. Natural or other pozzolans.
9. Aggregates.
10. Admixtures.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC's Acceptance Criteria AC380.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

H. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer's production facilities and delivery vehicles certified in accordance with NRMCA's certification requirements or equivalent approval by a State DOT.

C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.

1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Level 1. Testing agency laboratory supervisor tests to be an ACI-certified Concrete Laboratory Testing Technician, Level 2.

D. Field Quality-Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests on plastic concrete properties are to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with policies from ACI CPP 610.1 or an equivalent certification program.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

a. Admixture dosage rates.
b. Slump.
c. Air content.
d. Seven-day compressive strength.
e. 28-day compressive strength.
f. Evaluation of permeability-reducing admixtures.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

B. Form Liners: Store form liners under cover to protect from sunlight.

C. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1. Store reinforcement to avoid contact with earth.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When air temperature has fallen to, or is expected to fall below 40 deg F during the protection period, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.

1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.

2.2 FORM-FACING MATERIALS

A. As-Cast Surface Form-Facing Material:

1. Provide continuous, true, and smooth concrete surfaces.
2. Furnish in largest practicable sizes to minimize number of joints.
3. Acceptable Materials: As required to comply with Surface Finish designations as specified in specification and as follows:

    a. Plywood, metal, or other approved panel materials.

        1) APA HDO (high-density overlay).
        2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
        3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
        4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.

2.3 CONCRETE STANDARDS

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.4 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, Type II or Type I/II, gray.
2. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, portland blast-furnace slag cement.
3. Pozzolans: ASTM C618, Class C, F, or N.
4. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
5. Ground Glass Pozzolan: ASTM C1866/C1866M, Type GS or GE.
6. Silica Fume: ASTM C1240

C. Normal-Weight Aggregates:

1. Coarse Aggregate: ASTM C33/C33M

2. Maximum Coarse-Aggregate Size: 1 inches nominal.
3. Fine Aggregate: ASTM C33/C33M.
4. Recycled Aggregate: Provide documentation of characteristics of recycled aggregate and mechanical properties and durability of proposed concrete, which incorporates recycled aggregate to conform to appliable requirements for the class of concrete.
5. Alkali-Silica Reaction: Comply with one of the following for each aggregate used:

    a. Expansion Result of Aggregate: Not more than 0.04 percent at one year when tested in accordance with ASTM C1293.
    b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567. Do not use this option with fly ash with an alkali content greater than 4.0 percent. Submit supporting data for each aggregate showing expansion in excess of 0.10 percent when tested in accordance with ASTM C1260.
    c. Alkali Content in Concrete: Not to exceed 4 lb./cu. yd. for aggregate with expansion greater than or equal to 0.04 percent and less than 0.12 percent or 3 lb./cu. yd. for aggregate with expansion greater than or equal to 0.12 percent and less than 0.24 percent. Test aggregate reactivity in accordance with ASTM C1293. Calculate alkali content of concrete in accordance with ACI 301. Do not use this option with natural pozzolan or fly ash that has a calcium oxide content greater than 18 percent or an alkali content greater than 4.0 percent; or for an aggregate with expansion at one year greater than or equal to 0.24 percent when tested in accordance with ASTM C1293.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.

C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.6 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60 (Grade 420), deformed.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.8 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

2.9 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F (10 deg C): Black.
b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
c. Ambient Temperature Above 85 deg F (29 deg C): White.

C. Curing Paper: 8 ft. wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

D. Water: Potable water that does not cause staining of the surface.

E. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming, Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, nondissipating.

2.10 ACCESSORIES

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 in accordance with ASTM D2240.

C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Floor Slab Protective Covering: 8 ft. wide cellulose fabric.

E. Joint Dowel Bars: ASTM A615/A615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

2.11 CONCRETE MIXTURE MATERIALS

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland or hydraulic cement in concrete assigned to Exposure Class F3 as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Silica Fume: 40 lbs/cy, see the following locations for admixture
   a. Salt Storage Building: slab-on-grade, ramp, and walls
   b. Material Storage Building: slab-on-grade, walls, and pedestals
   c. Wash Bay: slab-on-grade
4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
2. Use permeability-reducing admixture in concrete mixtures where indicated.

2.12 CONCRETE MIXTURE CLASS TYPES

A. See Concrete Mixture Requirements table in the contract drawings for concrete mixture requirements.

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

B. Protection of In-Place Conditions:

1. Do not cut or puncture vapor retarder.
2. Repair damage and reseal vapor retarder before placing concrete.

C. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.3 TOLERANCES

A. Comply with ACI 117.

3.4 INSTALLATION OF FORMWORK

A. Comply with ACI 301 (ACI 301M).

B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M) and to comply with the Surface Finish designations as specified.

C. Limit concrete surface irregularities as follows:
1. Surface Finish-2.0: ACI 117 Class B, 1/4 inch (6 mm).

D. Construct forms tight enough to prevent loss of concrete mortar.

1. Minimize joints.
2. Exposed Concrete: Symmetrically align joints in forms.

E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
3. Install keyways, reglets, recesses, and other accessories, for easy removal.

F. Do not use rust-stained, steel, form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.

1. Provide and secure units to support screed strips
2. Use strike-off templates or compacting-type screeds.

H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.

1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
2. Locate temporary openings in forms at inconspicuous locations.

I. Chamfer exterior corners and edges of permanently exposed concrete.

J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches (305 mm).

K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

L. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.

1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.

M. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

N. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

O. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.5 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.6 INSTALLATION OF VAPOR RETARDERS

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides and sealing to vapor retarder.

3.7 INSTALLATION OF CAST-IN-PLACE CONCRETE

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.

4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.8 INSTALLATION OF JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

    a. Continue reinforcement across construction joints unless otherwise indicated.

C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints:

1. Install dowel bars and support assemblies at joints where indicated on Drawings.
2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.

F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.9 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch (25 mm), not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318 (ACI 318M).

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

G. Install welded-wire reinforcement in longest practicable lengths.

1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."

    a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches (305 mm).

2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches (50 mm) for plain wire and 8 inches (200 mm) for deformed wire.
3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
4. Lace overlaps with wire.

3.10 APPLICATION OF FINISHING FLOORS AND SLABS

A. Trowel Finish:

1. Apply to following locations:
   a. Truck Storage Building
   b. Maintenance Building
   c. Wash Bay
   d. Office Building

2. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
3. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
4. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
5. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
6. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
7. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
8. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:

   a. Slabs on Ground:

      1) Specified overall values of flatness, F_F 25; and of levelness, F_L 20; with minimum local values of flatness, F_F 17; and of levelness, F_L 15.

B. Trowel and Fine-Broom Finish: First apply a trowel finish to surfaces indicated on Drawings. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
   1. Apply to following locations:
      a. Cold Storage Building
      b. Material Storage Building
      c. Salt Storage Building

   2. Coordinate required final finish with Architect before application.
   3. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

3.11 APPLICATION OF FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

   1. ACI 301 (ACI 301M) Surface Finish SF-3.0:

      a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
      b. Remove projections larger than 1/8 inch (3 mm).
      c. Patch tie holes.
      d. Surface Tolerance: ACI 117 (ACI 117M) Class A.
      e. Locations: Apply to concrete surfaces exposed to public view.

3.12 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling in:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
6. Prior to pouring concrete, place and secure anchorage devices.

    a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    b. Cast anchor-bolt insert into bases.
    c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.13 APPLICATION OF CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. If forms remain during curing period, moist cure after loosening forms.
3. If removing forms before end of curing period, continue curing for remainder of curing period as follows:

a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
b. Continuous Sprinkling: Maintain concrete surface continuously wet.
c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

1) Recoat areas subject to heavy rainfall within three hours after initial application.
2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing after finishing concrete.
2. Interior Concrete Floors:

a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

a) Lap edges and ends of absorptive cover not less than 12 inches (300 mm).
b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive.

a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:

a) Water.
b) Continuous water-fog spray.

b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

   a) Lap edges and ends of absorptive cover not less than 12 inches (300 mm).
   b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive.

   a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
   b) Cure for not less than seven days.

3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

   a) Water.
   b) Continuous water-fog spray.

c. Floors to Receive Polished Finish: Contractor has option of the following:

1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.

   a) Lap edges and ends of absorptive cover not less than 12 inches (300 mm).
   b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.

2) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:

   a) Water.
   b) Continuous water-fog spray.

d. Floors To Receive Curing Compound:

1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Maintain continuity of coating, and repair damage during curing period.

4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer**.**

e. Floors To Receive Curing and Sealing Compound:

1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
2) Recoat areas subjected to heavy rainfall within three hours after initial application.
3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.14 APPLICATION OF LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than seven days' old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
4. Rinse with water; remove excess material until surface is dry.
5. Apply a second coat in a similar manner if surface has received a float finish or abrasive surface preparation.

B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.15 INSTALLATION OF JOINT FILLING

A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s).

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.

D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.16 INSTALLATION OF CONCRETE SURFACE REPAIRS

A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch, spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.

    a. Limit cut depth to 3/4 inch.
    b. Make edges of cuts perpendicular to concrete surface.
    c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
    d. Fill and compact with patching mortar before bonding agent has dried.
    e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.

    a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    b. Compact mortar in place and match surrounding surface.

3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.

D. Repairing Unformed Surfaces:

1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.

    a. Correct low and high areas.
    b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
3. After concrete has cured at least 14 days, correct high areas by grinding.
4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.

    a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.

    a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
    b. Feather edges to match adjacent floor elevations.

6. Correct other low areas scheduled to remain exposed with repair topping.

    a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations.
    b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.

    a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
    b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
    c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
    d. Place, compact, and finish to blend with adjacent finished concrete.
    e. Cure in same manner as adjacent concrete.

8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

    a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
    b. Dampen cleaned concrete surfaces and apply bonding agent.
    c. Place patching mortar before bonding agent has dried.
    d. Compact patching mortar and finish to match adjacent concrete.
    e. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

    a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301 (ACI 301M), including the following as applicable to each test and inspection:

        1) Project name.
        2) Name of testing agency.
        3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
        4) Name of concrete manufacturer.
        5) Date and time of inspection, sampling, and field testing.
        6) Date and time of concrete placement.
        7) Location in Work of concrete represented by samples.
        8) Date and time sample was obtained.
        9) Truck and batch ticket numbers.
        10) Design compressive strength at 28 days.
        11) Concrete mixture designation, proportions, and materials.
        12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.
        13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
        14) Type of fracture and compressive break strengths at seven days and 28 days.

4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.

C. Delivery Tickets: comply with ASTM C94/C94M.

D. Inspections:

1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.
2. Headed bolts and studs.
3. Steel-reinforcement placement.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.
8. Batch Plant Inspections: On a random basis, as determined by Architect.

E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 150 cu. yd. or fraction thereof.

    a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:

    a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    b. Perform additional tests as needed.

3. Slump Flow: ASTM C1611:

    a. One test at point of delivery for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
    b. Perform additional tests as needed.

4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;.

    a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M:

    a. One test hourly when air temperature is 40 deg F and below or 80 deg F (27 deg C) and above, and one test for each composite sample when strength test specimens are cast.

6. Concrete Density: ASTM C138/C138M:

    a. One test for each composite sample when strength test specimens are cast.

7. Unit Weight: ASTM C138/C138M density of fresh structural lightweight concrete.

    a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. The fresh density should be consistent with that associated with the equilibrium density within a tolerance of plus or minus 4 $lb/ft.^3$.

8. Compression Test Specimens: ASTM C31/C31M:

    a. Cast and standard cure two sets of two 6 inches by 12-inches cylindrical specimens for each composite sample.
    b. Cast, and field cure two sets of two standard cylindrical specimens for each composite sample.

9. Compressive-Strength Tests: ASTM C39/C39M.

a. Test one set of two standard cured specimens at seven days and one set of two specimens at 28 days.
b. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
11. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests:

    a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
    b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

        1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.

14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Architect.

3.18 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION 033000

SECTION 04 20 00 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Lintels.
3. Brick.
4. Mortar and grout materials.
5. Reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Accessories.
9. Mortar and grout mixes.

B. Products Installed but not Furnished under This Section:

1. Steel lintels in unit masonry.
2. Cavity wall insulation adhered to masonry backup.

C. Related Requirements:

1. Section 014339 "Mockups" for integrated exterior mockup requirements.
2. Section 019119.43 "Exterior Enclosure Commissioning."
3. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
4. Section 072100 "Thermal Insulation" for cavity wall insulation.
5. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Indicate sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Indicate bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315R. Indicate elevations of reinforced walls.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:

1. Decorative CMUs, in the form of small-scale units.
2. Pre-faced CMUs.
3. Clay face brick, in the form of straps of five or more bricks.
4. Colored mortar.
5. Weep/cavity vents.

1.5 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

B. Material Certificates: For each type of the following:

1. Masonry units.

a. Include data on material properties.
b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
c. For exposed brick, include test report for efflorescence in accordance with ASTM C67/C67M.
d. For surface-coated brick, include test report for durability of surface appearance after 50 cycles of freezing and thawing in accordance with ASTM C67/C67M.
e. For masonry units, include data and calculations establishing average net-area compressive strength of units.

2. Integral water repellent used in CMUs.
3. Cementitious materials. Include name of manufacturer, brand name, and type.
4. Mortar admixtures.
5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
6. Grout mixes. Include description of type and proportions of ingredients.
7. Reinforcing bars.
8. Joint reinforcement.

9. Anchors, ties, and metal accessories.

C. Qualification Statements: For testing agency.

D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.

E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602.

F. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

B. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

C. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

1. Clay Masonry Unit Test: For each type of unit required, according to ASTM C 67 for compressive strength.
2. Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength.
3. Mortar Test (Property Specification): For each mix required, according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
4. Mortar Test (Property Specification),: For each mix required, according to ASTM C 780 for compressive strength.
5. Prism Test: For each type of construction required, according to ASTM C 1314.

1.7 MOCKUPS

A. Wall Mockups: Build mockups to verify selections made under Sample submittals to set

quality standards for materials and execution and.

1. Build mockups for each type of exposed unit masonry construction in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories.

    a. Include a sealant-filled joint at least **16 inches** long in each mockup.
    b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately **12 inches** wide by **16 inches** high.
    c. Include through-wall flashing installed for a **24-inch** length in corner of exterior wall mockup approximately **16 inches** down from top of mockup, with a **12-inch** length of flashing left exposed to view (omit masonry above half of flashing).
    d. Include studs, sheathing, water-resistive barrier sheathing joint-and-penetration treatment air barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.

2. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
3. Protect accepted mockups from the elements with weather-resistant membrane.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.
5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of **24 inches** down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of **24 inches** down face next to unconstructed wythe, and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is **40 deg F** and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths

at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) in accordance with TMS 602.
2. Determine net-area compressive strength of masonry by testing masonry prisms in accordance with ASTM C1314.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for outside corners unless otherwise indicated.

B. Rigid, Cellular Thermal Insulation Units: Where indicated, units contain rigid, specially shaped, molded-polystyrene insulation units complying with ASTM C578, Type I, designed for installing in cores of masonry units.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Concrete Block Insulating Systems
    b. Shelter Enterprises Inc.

C. CMUs: ASTM C90, lightweight unless otherwise indicated.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
2. Size (Width): Manufactured to dimensions **3/8 inch** less than nominal dimensions.
3. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

D. Decorative CMUs: ASTM C90, lightweight.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Maxbloc L215 Light Range Buff NW, by Lee Building Products or comparable product by one of the following:

    a. **York Building Products**

2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
3. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph above.
4. Pattern and Texture: Standard pattern, split-face finish. Match Architect's samples.
5. Colors: Match Architect's samples.
6. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

2.5 LINTELS

A. Solid Concrete Masonry Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength of not less than that of CMUs.

B. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 032000 "Concrete Reinforcing," and with reinforcing bars indicated.

C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

B. Clay Face Brick: Facing brick complying with ASTM C216 or hollow brick complying with ASTM C652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area), Grade SW, Type FBX.

1. Basis-of-Design Product: Subject to compliance with requirements, provide 500 Classic by Kansas Brick & Tile Co. or comparable product by one of the

following:

a. Acme Brick Company
b. Belden Brick Company (The)
c. Boral Bricks, Inc; Boral Limited
d. Glen-Gery Corporation
e. Bowerston Shale Co.

2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3350 psi.
3. Initial Rate of Absorption: Less than **30 g/30 sq. in.** per minute when tested in accordance with ASTM C67/C67M.
4. Efflorescence: Provide brick that has been tested in accordance with ASTM C67/C67M and is rated "not effloresced."
5. Surface Coating: Brick with colors or textures produced by application of coatings withstand 50 cycles of freezing and thawing in accordance with ASTM C67/C67M with no observable difference in the applied finish when viewed from **10 ft.**.
6. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
7. Application: Use where brick is exposed unless otherwise indicated.
8. Color and Texture: Match Architect's samples.

2.7 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Cement: ASTM C1329/C1329M.

E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.

F. Colored Cement Products: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Masonry Cement:

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Lehigh Hanson
2) Spec Mix LLC
3) Amerimix

2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
3. Pigments do not exceed 10 percent of portland cement by weight.

G. Preblended Dry Mortar Mix: Packaged blend made from mortar cement, sand, and admixtures and complying with ASTM C1714/C1714M.

1. Preblended Dry Portland Cement Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

H. Aggregate for Mortar: ASTM C144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than **1/4 inch** thick, use aggregate graded with 100 percent passing the **No. 16** sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

I. Aggregate for Grout: ASTM C404.

J. Epoxy Pointing Mortar: ASTM C395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

K. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

L. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.

M. Water: Potable.

2.8 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, **Grade 60**.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from **0.148-inch** steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.

1. Exterior Walls: Hot-dip galvanized carbon steel.
2. Wire Size for Side Rods: 0.187-inch diameter.
3. Wire Size for Cross Rods: 0.187-inch diameter.
4. Wire Size for Veneer Ties: 0.187-inch diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than **16 inches** o.c.
6. Provide in lengths of not less than **10 ft.**, with prefabricated corner and tee units.

D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

E. Masonry Joint Reinforcement for Multiwythe Masonry

1. Ladder type with 1 side rod at each face shell of hollow masonry units more than 4 inches wide, plus 1 side rod at each wythe of masonry 4 inches wide or less.
2. Tab type, either ladder or truss design, with 1 side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe but with at least 5/8-inchcover on outside face.
3. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.

F. Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single **0.187-inch-** diameter, hot-dip galvanized carbon steel continuous wire.

2.9 TIES AND ANCHORS

A. General: Ties and anchors extend at least **1-1/2 inches** into veneer but with at least a **5/8-inch** cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Mill-Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A641/A641M, Class 1 coating.
2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A153/A153M, Class B-2 coating.
3. Stainless Steel Wire: ASTM A580/A580M, Type 304.
4. Galvanized-Steel Sheet: ASTM A653/A653M, Commercial Steel, **G60** zinc coating.
5. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.
6. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.
7. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
8. Stainless Steel Bars: ASTM A276 or ASTM A666, Type 304.

C. Corrugated-Metal Ties: Metal strips not less than **7/8 inch** wide with corrugations

having a wavelength of **0.3 to 0.5 inch** and an amplitude of **0.06 to 0.10 inch** made from 0.0336-inch- thick steel sheet, galvanized after fabrication.

D. Individual Wire Ties: Rectangular units with closed ends and not less than **4 inches** wide.

1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than **2 inches** long for masonry constructed from solid units.
2. Where wythes are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of **1-1/4 inches**.
3. Wire: Fabricate from 3/16-inch- diameter, hot-dip galvanized steel wire.

E. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped **1/4-inch-** diameter, hot-dip galvanized steel wire.
2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel wire.

F. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.060-inch- thick steel sheet, galvanized after fabrication.
2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel orstainless steel wire.
3. Corrugated-Metal Ties: Metal strips not less than **7/8 inch** wide with corrugations having a wavelength of **0.3 to 0.5 inch** and an amplitude of **0.06 to 0.10 inch** made from 0.0635-inch- thick steel sheet, galvanized after fabrication with dovetail tabs for inserting into slots in concrete.

G. Partition Top Anchors: **0.105-inch-** thick metal plate with a **3/8-inch-** diameter metal rod **6 inches** long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

H. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins unless otherwise indicated.

1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A153/A153M.

I. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist a **100 lbf** load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of **0.05 inch**.

2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0785-inch- thick steel sheet, galvanized after fabrication.
3. Fabricate wire ties from 0.187-inch- diameter, hot-dip galvanized-steel wire unless otherwise indicated.
4. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
5. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.

    a. Anchor Section: Corrosion-resistant, self-drilling, eye-screw designed to receive wire tie. Eye-screw has spacer that seats directly against framing and is same thickness as sheathing and has gasketed, washer head that covers hole in sheathing.
    b. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch- diameter, hot-dip galvanized steel or stainless-steel wire.

6. Slip-in, Masonry-Veneer Anchors: Units consisting of a wire tie section and an anchor section designed to interlock with metal studs and be slipped into place as sheathing is installed.

    a. Wire-Type Anchor: Bent wire anchor section with an eye to receive the wire tie. Wire tie has a vertical leg that slips into the eye of anchor section and allows vertical adjustment. Both sections are made from 3/16-inch, hot-dip galvanized wire.

7. Stainless Steel Drill Screws for Steel Studs: ASTM C954 except manufactured with hex washer head and neoprene or EPDM washer, **No. 10** diameter by length required to penetrate steel stud flange with not less than three exposed threads; either made from Type 410 stainless steel or made with a carbon-steel drill point and 300 Series stainless steel shank.

2.10 EMBEDDED FLASHING

A. Metal Flashing:

1. General: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

    a. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, **0.016 inch** thick.
    b. Copper: ASTM B370, Temper H00, cold-rolled copper sheet, 16 oz./sq. ft. weight or 0.0216 inch thick or ASTM B370, Temper H01, high-yield copper sheet, 12 oz./sq. ft. weight or 0.0162 inch thick.
    c. Fabricate continuous flashings in sections **96 inches** long minimum, but not exceeding **12 ft**. Provide splice plates at joints of formed, smooth metal flashing.
    d. Fabricate through-wall metal flashing embedded in masonry from stainless steel orcopper, with sawtooth ribs at **3-inch** intervals along length of flashing to provide an integral mortar bond.
    e. Fabricate through-wall flashing with snaplock receiver on exterior face

where indicated to receive counterflashing.

f. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing **1/2 inch** out from wall, with outer edge bent down 30 degrees and hemmed.

g. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself **3/4 inch** at exterior face of wall and down into joint **1/4 inch** to form a stop for retaining sealant backer rod.

h. Fabricate metal drip edges and sealant stops for sawtooth metal flashing from plain metal flashing of same metal as sawtooth flashing and extending at least **3 inches** into wall with hemmed inner edge to receive sawtooth flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.

i. Fabricate metal drip edges from stainless steel. Extend at least **3 inches** into wall and **1/2 inch** out from wall, with outer edge bent down 30 degrees and hemmed.

j. Fabricate metal sealant stops from stainless steel. Extend at least **3 inches** into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for **3/4 inch** and down into joint **1/4 inch** to form a stop for retaining sealant backer rod.

k. Fabricate metal expansion-joint strips from stainless steel orcopper to shapes indicated.

l. Solder metal items at corners.

B. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Copper-Laminated Flashing 5-oz. /sq. ft. copper sheet bonded between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
2. Asphalt-Coated Copper Flashing: 5-oz. /sq. ft. copper sheet coated with flexible asphalt. Use only where flashing is fully concealed in masonry.
3. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.030 inch.

    a. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

4. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.

    a. Monolithic Sheet: Elastomeric thermoplastic flashing, 0.040 inch thick.
    b. Self-Adhesive Sheet: Elastomeric thermoplastic flashing, 0.025-inch-thick, with a 0.015-inch-thick coating of adhesive.
    c. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025-inch-thick, with a 0.015-inch-thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches) from edge.
    d. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

5. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D 4637, and 0.040 inch thick.

C. Application: Unless otherwise indicated, use the following:

1. Where flashing is indicated to receive counterflashing, use metal flashing.
2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
3. Where flashing is fully concealed, use metal flashing or flexible flashing.

D. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

E. Solder and Sealants for Sheet Metal Flashings:

1. Solder for Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
2. Solder for Copper: ASTM B32, Grade Sn50 50 percent tin and 50 percent lead.
3. Elastomeric Sealant: ASTM C920, chemically curing urethane sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and remain watertight.

F. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

G. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch.

H. Termination Bars for Flexible Flashing, Flanged: Stainless steel sheet 0.019 inch by 1-1/2 inches with a **3/8-inch** flange at top and bottom.

2.11 ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

D. Weep/Cavity Vents: Use one of the following unless otherwise indicated:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant

polypropylene copolymer, full height and width of head joint and depth **1/8 inch** less than depth of outer wythe, in color selected from manufacturer's standard.

2. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth **1/8 inch** less than depth of outer wythe; in color selected from manufacturer's standard.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity. Provide one of the following configurations.

1. Mortar Deflector: Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches that prevent clogging with mortar droppings.
2. Mortar Deflector Strips 2: Not less than 3/4 inch 1-1/2 inches thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
3. asdf
4. Sheets or strips full depth of cavity and installed to full height of cavity.
5. Sheets or strips full depth of cavity and installed to full height of cavity.
6. Sheets or strips full depth of cavity and installed to full height of cavity.

F. Masonry Cell Fill: Foamed-in-place masonry cell fill.

G. Proprietary Acidic Masonry Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.12 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.
3. For exterior masonry, use portland cement-lime mortar.
4. For reinforced masonry, use portland cement-lime mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.

1. For masonry below grade or in contact with earth, use Type M.

2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
5. For interior nonload-bearing partitions, Type O may be used instead of Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments do not exceed 10 percent of portland cement by weight.
2. Pigments do not exceed 5 percent of masonry cement or mortar cement by weight.
3. Mix to match Architect's sample.
4. Application: Use pigmented mortar for exposed mortar joints with the following units: Decorative CMUs , Face brick. .

E. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1.
3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

F. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's written instructions.

1. Application: Use epoxy pointing mortar for exposed mortar joints with the following units: Pre-faced CMUs..

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds **30 g/30 sq. in.** per minute when tested in accordance with ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus **1/2 inch** or minus **1/4 inch**.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus **1/2 inch**.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus **1/4 inch** in a story height or **1/2 inch** total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than **1/4 inch in 10 ft.**, or **1/2-inch** maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than **1/8 inch in 10 ft.**, **1/4 inch in 20 ft.**, or **1/2-inch** maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than **1/4 inch in 10 ft.**, **3/8 inch in 20 ft.**, or **1/2-inch** maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than **1/8 inch**

in 10 ft., **1/4 inch in 20 ft.**, or **1/2-inch** maximum.

5. For lines and surfaces, do not vary from straight by more than **1/4 inch in 10 ft.**, **3/8 inch in 20 ft.**, or **1/2-inch** maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than **1/4 inch in 10 ft.**, or **1/2-inch** maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than **1/16 inch** except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**, with a maximum thickness limited to **1/2 inch**.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than **1/8 inch**.
3. For head and collar joints, do not vary from thickness indicated by more than plus **3/8 inch** or minus **1/4 inch**.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus **1/8 inch**.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than **1/16 inch** from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal **4-inch** horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal **4-inch** horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a

layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout **24 inches** under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors, and push tubes down into grout to provide **1/2-inch** clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs and hollow brick as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Rake out mortar joints at pre-faced CMUs to a uniform depth of **1/4 inch** and point with epoxy mortar to comply with epoxy-mortar manufacturer's written instructions.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

F. Cut joints flush where indicated to receive waterproofing cavity wall insulation air barriers unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together using one of the following methods:

1. Individual Metal Ties: Provide ties as indicated installed in horizontal joints, but not less than one metal tie for 4.5 sq. ft. of wall area spaced not to exceed 36 inches o.c. horizontally and **16 inches** o.c. vertically. Stagger ties in alternate courses. Provide additional ties within **12 inches** of openings and space not more than **36 inches** apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than **24 inches** o.c. vertically.

   a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
   b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.

2. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

   a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
   b. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties.
   c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.

3. Header Bonding: Provide masonry unit headers extending not less than **3 inches** into each wythe. Space headers not more than 8 inches clear horizontally and **16 inches** clear vertically.
4. Masonry-Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Bond wythes of cavity walls together using bonding system indicated on Drawings.

C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

D. Parge cavity face of backup wythe in a single coat approximately **3/8 inch** thick. Trowel face of parge coat smooth.

E. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately **12 inches** o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as indicated.

1. Fill cracks and open gaps in insulation with crack sealer compatible with

insulation and masonry.

3.7 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to wall framing and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Fasten screw-attached anchors through sheathing to wall framing to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than **18 inches** o.c. vertically and **24 inches** o.c. horizontally, with not less than one anchor for each **2 sq. ft.** of wall area. Install additional anchors within **12 inches** of openings and at intervals, not exceeding **8 inches**, around perimeter.

B. Provide not less than 2 inches of airspace between back of masonry veneer and face of sheathing.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

3.8 MASONRY-CELL FILL

A. Install molded-polystyrene insulation units into masonry unit cells before laying units.

3.9 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of **5/8 inch** on exterior side of walls, **1/2 inch** elsewhere. Lap reinforcement a minimum of **6 inches**.

1. Space reinforcement not more than **16 inches** o.c.
2. Space reinforcement not more than **8 inches** o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than **8 inches** above and below wall openings and extending **12 inches** beyond openings.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:

1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than **24 inches** o.c. vertically and **36 inches** o.c. horizontally.

3.11 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

C. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint **4 inches** in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.12 LINTELS

A. Install steel lintels where indicated.

B. Provide concrete masonry or lintels where indicated and where openings of more than **12 inches** for brick-size units and **24 inches** for block-size units are indicated without structural steel or other supporting lintels.

C. Provide minimum bearing of **8 inches** at each jamb unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 4 inches, and through inner wythe to within **1/2 inch** of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately **2 inches** on interior face.
3. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least **8 inches**; with upper edge tucked under building paper or building wrap , lapping at least **4 inches**.
4. At lintels and shelf angles, extend flashing **6 inches** minimum, to edge of next full unit at each end. At heads and sills, extend flashing **6 inches** minimum, to edge of next full unit and turn ends up not less than **2 inches** to form end dams.
5. Interlock end joints of sawtooth sheet metal flashing by overlapping ribs not less than **1-1/2 inches** or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
6. Install metal drip edges with sawtooth sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
7. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
8. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch** back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
9. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

D. Install reglets and nailers for flashing and other related construction where they are indicated to be built into masonry.

E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/cavity vent products to form weep holes.
2. Space weep holes **24 inches** o.c. unless otherwise indicated.
3. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.

F. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Accessories" Article.

G. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.14 REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements will be at Contractor's expense.

B. Inspections: Special inspections in accordance withLevel 2 in TMS 402.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each **5000 sq. ft.** of wall area or portion thereof.

E. Clay Masonry Unit Test: For each type of unit provided, in accordance with ASTM C67/C67M for compressive strength.

F. Concrete Masonry Unit Test: For each type of unit provided, in accordance with ASTM C140/C140M for compressive strength.

G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, in accordance with ASTM C780.

H. Mortar Test (Property Specification): For each mix provided, in accordance with ASTM C780. Test mortar for compressive strength, ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.

I. Grout Test (Compressive Strength): For each mix provided, in accordance with ASTM C1019.

J. Prism Test: For each type of construction provided, in accordance with ASTM C1314 at 28 days.

3.16 PARGING

A. Parge exterior faces of below-grade masonry walls, where indicated, in two uniform coats to a total thickness of **3/4 inch**. Dampen wall before applying first coat, and scarify first coat to ensure full bond to subsequent coat.

B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of **1/8 inch per foot**. Form a wash at top of parging and a cove at bottom.

C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.17 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.18 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 04 20 00

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel materials.
2. Shrinkage-resistant grout.
3. Metal deck.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other steel items not defined as structural steel.
2. Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" and for painting requirements.
3. Section 133419 "Metal Building Systems" for structural steel.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.

C. Heavy Sections: Rolled and built-up sections as follows:

1. Shapes included in ASTM A6/A6M with flanges thicker than 1-1/2 inches.
2. Welded built-up members with plates thicker than 2 inches.
3. Column base plates thicker than 2 inches.

D. Protected Zone: Structural members or portions of structural members indicated as "protected zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Threaded rods.
5. Shop primer.
6. Galvanized-steel primer.
7. Galvanized repair paint.
8. Shrinkage-resistant grout.
9. Metal deck.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
5. Identify members not to be shop primed.
6. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

C. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, and testing agency.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Mill test reports for structural-steel materials, including chemical and physical properties.

E. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.

2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.

F. Survey of existing conditions.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

C. Welding /D1.3MQualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M and D1.3/D1.3M

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

C. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 360.
3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

4. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.

B. Connection Design Information:
1. Fabricator's experienced steel detailer selects or completes connections in accordance with ANSI/AISC 303.

a. Select and complete connections using schematic details indicated and ANSI/AISC 360.
b. Use Load and Resistance Factor Design; data are given at factored-load level.

C. Moment Connections: Type FR, fully restrained.

D. Construction: Moment frame and cantilevered columns.

2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M.

B. Channels, Angles, S-Shapes: ASTM A36/A36M.

C. Plate and Bar: ASTM A36/A36M.

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.3 BOLTS AND CONNECTORS

A. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip or mechanically deposited zinc coating.
2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating finish.

2.4 RODS

A. Headed Anchor Rods: ASTM F1554, Grade 36, straight.

1. Nuts: ASTM A563 heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436, Type 1, hardened carbon steel.
4. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.

B. Threaded Rods: ASTM A36/A36M.

1. Nuts: ASTM A63 heavy-hex carbon steel.
2. Washers: ASTM F436, Type 1, hardened carbon steel.
3. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.

2.5 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2.

F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

2.9 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

    a. Liquid Penetrant Inspection: ASTM E165/E165M.
    b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    c. Ultrasonic Inspection: ASTM E164.
    d. Radiographic Inspection: ASTM E94/E94M.

4. Prepare test and inspection reports.

2.10 METAL DECK

A. Fabrication of Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:

1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating.
2. Deck Profile: As indicated .
3. Profile Depth: As indicated .
4. Design Uncoated-Steel Thickness: As indicated .
5. Span Condition: As indicated.
6. Side Laps: Overlapped or interlocking seam at Contractor's option.

2.11 ACCESSORIES

A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Galvanizing Repair Paint: ASTM A780/A780M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

B. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 DECK INSTALLATION

A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.

B. Place deck panels on supporting member and adjust to final position with ends accurately aligned and bearing on supporting member before being permanently fastened. Do not stretch or contract side-lap interlocks.

C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

G. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated on drawings.

H. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated on drawings.

I. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:

1. End Joints: Lapped 2 inches (50 mm) minimum .

3.6 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

3.7 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

4. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.

a. Field welds will be subject to inspection.

5. Steel decking will be considered defective if it does not pass tests and inspections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M..

    a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

        1) Liquid Penetrant Inspection: ASTM E165/E165M.
        2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
        3) Ultrasonic Inspection: ASTM E164.
        4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION 051200

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-formed steel framing.
2. Exterior non-load-bearing wall framing.
3. Vertical deflection clips, exterior.
4. Interior non-load-bearing wall framing.
5. Vertical deflection clips, interior.

B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, within height limitations and ceiling-suspension assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
3. Signed and sealed by the qualified professional engineer responsible for their preparation.

C. Delegated Design Submittal: For cold-formed steel framing, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Product Certificates: For each type of code-compliance certification for studs and track.

D. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Horizontal drift deflection clips
7. Miscellaneous structural clips and accessories.

E. Research Reports:

1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC380.

F. Delegated Design Engineer Qualifications: For cold-formed steel framing.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by International Accreditation Service (IAS) to IAS AC98 criteria for testing indicated.

B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

C. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

D. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.

B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated on Drawings.
2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:

a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height.
b. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of **5 lbf/sq. ft.**.

3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of **120 deg F**.
4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

a. Upward and downward movement of 3/4 inch.

5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.

2.2 COLD-FORMED STEEL FRAMING

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. ClarkDietrich
2. Marino\WARE
3. SCAFCO Steel Stud Company; Stone Group of Companies
4. Steel Network, Inc. (The)

B. Framing Members, General: Comply with AISI S240 for conditions indicated.

C. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of

grade and coating designation as follows:

1. Grade: As required by structural performance.
2. Coating: G90 or equivalent.

D. Steel Sheet for Vertical Deflection Drift Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: As required by structural performance.
2. Coating: **G90** ..

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Steel Thickness: 0.0538 inch.
2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Steel Thickness: Matching steel studs.
2. Flange Width: 1-1/4 inches.

C. Vertical Deflection Clips, Exterior: Manufacturer's standard bypass orhead clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ClarkDietrich
b. Marino\WARE
c. SCAFCO Steel Stud Company; Stone Group of Companies
d. Steel Network, Inc. (The)

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:

1. Minimum Base-Steel Thickness: 0.0538 inch.
2. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.

2.4 INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated,

punched, with stiffened flanges, and as follows:

1. Minimum Base-Steel Thickness: 0.0538 inch.
2. Flange Width: 1-5/8 inches.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Steel Thickness: Matching steel studs.
2. Flange Width: 1-1/4 inches.

C. Vertical Deflection Clips, Interior: Manufacturer's standard bypass clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ClarkDietrich
b. Marino\WARE
c. SCAFCO Steel Stud Company; Stone Group of Companies

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:

1. Minimum Base-Steel Thickness: 0.0538 inch.
2. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.

E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 SOFFIT FRAMING

A. Exterior Soffit Framing: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0538 inch.
2. Flange Width: 1-5/8 inches, minimum.

2.6 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic-coated steel sheet, of same grade and coating designation used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole-reinforcing plates.
11. Backer plates.

2.7 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process in accordance with ASTM A123/A123M.

B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts,,headless, hooked bolts , andheadless bolts, with encased end threaded carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process in accordance with ASTM A153/A153M, Class C.

C. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

D. Welding Electrodes: Comply with AWS standards.

2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A780/A780M or SSPC-Paint 20.

B. Cement Grout: Portland cement, ASTM C476, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.

D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

E. Sill Sealer Gasket: Closed-cell neoprene foam, **1/4 inch** thick, selected from

manufacturer's standard widths to match width of bottom track or rim track members as required.

F. Sill Sealer Gasket/Termite Barrier: Minimum **68-mil** nominal thickness, self-adhering sheet consisting of **64 mils** of rubberized asphalt laminated on one side to a **4-mil-** thick, polyethylene-film reinforcement, and with release liner on adhesive side.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Polyguard Products, Inc.

2. Physical Properties:

a. Peel Adhesion: **17.0 lb/in** of width when tested in accordance with ASTM D412.
b. Low-Temperature Flexibility: Pass at **minus 25 deg F** when tested in accordance with ASTM D146/D146M.
c. Water Vapor Permeance: **0.05 perm** maximum when tested in accordance with ASTM E96/E96M, Method B.
d. Resistance to Termite Penetration: Comply with ICC-ES AC380.

2.9 FABRICATION

A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, in accordance with AISI S240 and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install in accordance with Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.

4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, in accordance with Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.

C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum

allowable variation of **1/8 inch in 10 ft.** and as follows:

1. Spacing: Space individual framing members no more than plus or minus **1/8 inch** from plan location. Cumulative errors are not to exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of **1/8 inch**.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

B. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION OF COLD-FORMED STEEL FRAMING

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing in accordance with ASTM C1007, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding **1/16 inch**.

D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners, install in accordance with Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

H. Install insulation, specified in Section 072100 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Install continuous track sized to match studs. Align track accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection track and anchor to building structure.
2. Connect vertical deflection clips to bypassing studs and anchor to building structure.
3. Connect drift clips to cold-formed steel framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than **48 inches** apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel U-channel, welded or mechanically fastened

to webs of punched studs.
2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION OF INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Install continuous track sized to match studs. Align track accurately and securely anchor to supporting structure.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection track and anchor to building structure.
2. Connect vertical deflection clips to studs and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than **48 inches** apart. Fasten at each stud intersection.

1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.6 INSTALLATION TOLERANCES

A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 ft.** and as follows:

1. Space individual framing members no more than plus or minus **1/8 inch** from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.7 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 40 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-retardant-treated lumber.
2. Dimension lumber framing.
3. Miscellaneous lumber.
4. Plywood backing panels.

B. Related Requirements:

1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

1.2 DEFINITIONS

A. Boards or Strips: Lumber of less than **2 inches nominal** size in least dimension.

B. Dimension Lumber: Lumber of **2 inches nominal** size or greater but less than **5 inches nominal** size in least dimension.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. 1. Fire-retardant-treated wood.
2. 2. Power-driven fasteners.

3. 3. Post-installed anchors.
4. 4. Metal framing anchors.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.

B. Maximum Moisture Content:

1. Boards: 19 percent.
2. Dimension Lumber: 19 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED LUMBER

A. General: Where fire-retardant-treated materials are indicated, materials are to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than **10.5 feet** beyond the centerline of the burners at any time during the test.

1. Treatment is not to promote corrosion of metal fasteners.
2. Exterior Type: Treated materials are to comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering in accordance with ASTM D2898. Use for exterior locations and where indicated.

3. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber is to be tested according to ASTM D5664 and design value adjustment factors are to be calculated according to ASTM D6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.

C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency and other information required by authorities having jurisdiction.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

E. For exposed items indicated to receive a stained or natural finish, chemical formulations are not to bleed through, contain colorants, or otherwise adversely affect finishes.

F. Application: Treat all rough carpentry unless otherwise indicated.

1. Concealed blocking.
2. Framing for non-load-bearing partitions.
3. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
4. Plywood backing panels.

2.3 DIMENSION LUMBER FRAMING

A. Ceiling Joists: Construction or No. 2 grade.

1. Species:

a. Hem-fir (north); NLGA.
b. Douglas fir-larch; WCLIB or WWPA.
c. Douglas fir-larch (north); NLGA.
d. Southern pine or mixed southern pine; SPIB.
e. Spruce-pine-fir; NLGA.
f. Hem-fir; WCLIB or WWPA.
g. Douglas fir-south; WWPA.
h. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
i. Northern species; NLGA.
j. Eastern softwoods; NeLMA.
k. Western woods; WCLIB or WWPA.

B. Joists, Rafters, and Other Framing by Grade: Construction or No. 2 grade.

1. Species:

    a. Hem-fir (north); NLGA.
    b. Douglas fir-larch; WCLIB or WWPA.
    c. Southern pine or mixed southern pine; SPIB.
    d. Spruce-pine-fir; NLGA.
    e. Douglas fir-south; WWPA.
    f. Hem-fir; WCLIB or WWPA.
    g. Douglas fir-larch (north); NLGA.
    h. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.4 MISCELLANEOUS LUMBER

A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine or southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.
7. Northern species; NLGA.
8. Eastern softwoods; NeLMA.

C. Roofing Nailers: Structural- or No. 2-grade lumber or better; kiln-dried Douglas fir, southern pine, or wood having similar decay-resistant properties.

D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, , fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 FASTENERS

A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than **1-1/2 inches** into wood substrate.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329 orof Type 304 stainless steel in the wash bay area.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.7 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. MiTek Industries, Inc.
2. Simpson Strong-Tie Co., Inc.
3. Tamlyn

B. Materials: Unless otherwise indicated, fabricate from the following materials:

1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, **G60** coating designation.

   a. Use for interior locations unless otherwise indicated.

2. Heavy-Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); **G185** coating designation; and not less than **0.036 inch** thick.

   a. Use for wood-preservative-treated lumber and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring,nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than **16 inches** o.c.

G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than **96 inches** o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

END OF SECTION 06 10 00

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof sheathing.
2. Sheathing joint-and-penetration treatment materials.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Wall sheathing.
2. Roof sheathing.
3. Sheathing joint-and-penetration treatment materials.

B. Product Data Submittals: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
2. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5516.
3. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Shop Drawings: For air-barrier and water-resistant glass-mat gypsum sheathing assemblies.

1. Show locations and extent of sheathing, accessories, and assemblies specific to Project conditions.
2. Include details for sheathing joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: From air-barrier and water-resistant glass-mat gypsum sheathing manufacturer, certifying compatibility of sheathing accessory materials with Project materials that connect to or that come in contact with the sheathing.

B. Product Test Reports: For each air-barrier and water-resistant glass-mat gypsum sheathing assembly, indicating compliance with specified requirements, for tests performed by a qualified testing agency.

C. Evaluation Reports: For the following, from ICC-ES:

1. Fire-retardant-treated plywood.
2. Air-barrier and water-resistant glass-mat gypsum sheathing.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested in accordance with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

B. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing Performance: Air-barrier and water-resistant glass-mat gypsum sheathing assembly, and seals with adjacent construction, are to be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies are to be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.2 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than **10.5 feet** beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials are to comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering in accordance with ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber plywood is to be tested in accordance with ASTM D5516 and design value adjustment factors are to be calculated in accordance with ASTM D6305. Span ratings after treatment are to be not less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: Treat all plywood unless otherwise indicated.

2.3 ROOF SHEATHING

A. Oriented-Strand-Board Sheathing, Roofs: DOC PS 2, Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 24/0.
2. Nominal Thickness: Not less than 5/8 inch.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than **0.0329 inch** thick, use screws that comply with ASTM C1002.
2. For steel framing from **0.033 to 0.112 inch** thick, use screws that comply with ASTM C954.

G. Screws for Fastening Composite Nail Base Insulated Roof Sheathing to Metal Roof Deck: Steel drill screws, in type and length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours in accordance with ASTM B117. Provide washers or plates if recommended by sheathing manufacturer.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Paper-Surfaced and Glass-Mat Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."

B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum **2 inches** wide, **10 by 10 or 10 by 20 threads/inch**, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

C. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 INSTALLATION OF WOOD STRUCTURAL PANEL

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Screw to cold-formed metal framing.
b. Space panels **1/8 inch** apart at edges and ends.

3.3 INSTALLATION OF GYPSUM SHEATHING

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install panels with a **3/8-inch** gap where non-load-bearing construction abuts

structural elements.

3. Install panels with a **1/4-inch** gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately **8 inches** o.c. and set back a minimum of **3/8 inch** from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Seal sheathing joints in accordance with sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.4 INSTALLATION OF CEMENTITIOUS BACKER UNITS

A. Install panels and treat joints in accordance with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 INSTALLATION OF FIBERBOARD SHEATHING

A. Comply with ASTM C846 and with manufacturer's written instructions.

B. Fasten fiberboard sheathing panels to intermediate supports and then at edges and ends. Use galvanized roofing nails or galvanized staples; comply with manufacturer's recommended spacing and referenced fastening schedule. Drive fasteners flush with surface of sheathing and locate perimeter fasteners at least **3/8 inch** from edges and ends.

C. Install sheathing vertically with long edges parallel to, and centered over, studs. Install solid wood blocking where end joints do not occur over framing. Allow **1/8-inch** open space between edges and ends of adjacent units. Stagger horizontal joints if any.

D. Cover sheathing as soon as practical after installation to prevent deterioration from

wetting.

3.6 INSTALLATION OF FOAM-PLASTIC SHEATHING

A. Comply with manufacturer's written instructions.

B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.

C. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

3.7 INSTALLATION OF PARTICLEBOARD UNDERLAYMENT

A. Comply with CPA's recommendations for type of subfloor indicated. Fill and sand gouges, gaps, and chipped edges. Sand uneven joints flush.

1. Fastening Method: Glue and nail underlayment to subflooring.

3.8 INSTALLATION OF HARDBOARD UNDERLAYMENT

A. Comply with CPA's recommendations and hardboard manufacturer's written instructions for preparing and applying hardboard underlayment.

1. Fastening Method: Nail underlayment to subflooring.

END OF SECTION 06 16 00

SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Cabinet hardware and accessories.
3. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

C. Samples: For each exposed product and for each color and texture specified.

D. Samples for Verification: For the following:

1. Plastic Laminates: 8 by 10 inches, for each type, color, pattern, and surface finish required.
   a. Provide edge banding on one edge.
2. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and Installer.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Manufacturer of products.

1.5 FIELD CONDITIONS

A. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.

B. Architectural Woodwork Standards Grade: Custom.

C. Type of Construction: Frameless.

D. Door and Drawer-Front Style: Flush overlay.

E. High-Pressure Decorative Laminate: ISO 4586-3, grades as indicated or if not indicated, as required by quality standard.

F. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. PL-1
   a. Manufacturer: Wilsonart
   b. Color: 7850_9 Beigewood
2. PL-2
   a. Manufacturer: Wilsonart
   b. Color: 4878_7 Pewter Mesh
3. Basis-of-Design Product: Provide product indicated on Drawings or comparable product by one of the following.

   a. ABET Inc.
   b. Formica Corporation.

c. Laminart LLC.
d. Pionite; a Panolam Industries International, Inc. brand.

G. Exposed Surfaces:

1. Plastic-Laminate Grade: VGS.
2. Edges: Grade HGS.
3. Pattern Direction: Vertically for doors and fixed panels, horizontally for drawer fronts.

H. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, ISO 4586-3, grade to match exposed surface.

I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
2. Particleboard (Medium Density): ANSI A208.1, Grade M-2-Exterior Glue.
3. Softwood Plywood: DOC PS 1, medium-density overlay.
4. Thermally Fused Laminate (TFL) Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of ISO 4586.

2.3 CABINET HARDWARE AND ACCESSORIES

A. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets.

B. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:

1. Semiconcealed Hinges for Flush Doors: ANSI/BHMA A156.9, B01361.
2. Semiconcealed Hinges for Overlay Doors: ANSI/BHMA A156.9, B01521.

C. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening, self-closing.

D. Back-Mounted Pulls: ANSI/BHMA A156.9, B02011.

E. Wire Pulls: Stainless Steel, Brushed. Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.

F. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.

G. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

H. Shelf Rests: ANSI/BHMA A156.9, B04013; metal.

I. Drawer Slides: ANSI/BHMA A156.9.

1. Standard Duty (Grade 1 and Grade 2): Side mount and extending under bottom edge of drawer.
2. Heavy-Duty (Grade 1HD-100 and Grade 1HD-200): .

a. Type: Full extension.
b. Material: Zinc-plated ball bearing slides.

J. Door Locks: ANSI/BHMA A156.11, E07121.

K. Drawer Locks: ANSI/BHMA A156.11, E07041.

L. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.

M. Grommets for Cable Passage: 1-1/4-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.

N. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
1. Satin Stainless Steel: ANSI/BHMA 630.

O. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesive for Bonding Plastic Laminate: Type I, waterproof type as selected by fabricator to comply with requirements.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.

B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
1. Notify Architect seven days in advance of the dates and times architectural cabinet fabrication will be complete.
2. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

B. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide

unencumbered operation. Complete installation of hardware and accessory items as indicated.

3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

END OF SECTION 064116

SECTION 06 64 00 - PLASTIC PANELING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic sheet paneling.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For plastic paneling and trim accessories, in manufacturer's standard sizes.

1.3 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain plastic paneling and trim accessories from single manufacturer.

2.2 PLASTIC SHEET PANELING

A. Glass-Fiber-Reinforced Plastic Paneling: Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D5319.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Crane Composites, Inc.
b. Glasteel
c. Marlite, Inc.
d. Newcourt, Inc.
e. Nudo
f. Parkland Plastics

2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency in accordance with ASTM E84. Identify products with appropriate markings of applicable testing agency.

   a. Flame-Spread Index: 200 or less.
   b. Smoke-Developed Index: 450 or less.

3. Nominal Thickness: Not less than 0.075 inch.
4. Surface Finish: As selected by Architect from manufacturer's full range.
5. Color: White.

2.3 ACCESSORIES

A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.

   1. Color: Match panels.

B. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.

C. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.

D. Adhesive: As recommended by plastic paneling manufacturer.

E. Sealant: Mildew-resistant, single-component, neutral-curing silicone sealant recommended by plastic paneling manufacturer

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.

B. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.

C. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.

1. Mark plumb lines on substrate at trim accessory locations for accurate installation.
2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

A. Install plastic paneling according to manufacturer's written instructions.

B. Install panels in a full spread of adhesive.

C. Install panels with fasteners. Layout fastener locations and mark on face of panels so that fasteners are accurately aligned.

1. Drill oversized fastener holes in panels and center fasteners in holes.
2. Apply sealant to fastener holes before installing fasteners.

D. Install trim accessories with adhesive and nails. Do not fasten through panels.

E. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.

F. Maintain uniform space between panels and wall fixtures. Fill space with sealant.

G. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.

H. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 06 64 00

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board insulation.
2. Mineral-wool blanket insulation.
3. Loose-fill insulation.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for insulation installed in masonry cells.
2. Section 074113.16 "Standing-Seam Metal Roof Panels" for roof insulation in Brine Building.
3. Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.

1. Sign, date, and post the certification in a conspicuous location on Project site.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation

and concealment.

2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than Class A, 25 and 450 when tested in accordance with ASTM E84.

B. Fire-Resistance Ratings: Comply with ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.

C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

D. Labeling: Provide identification of mark indicating R-value of each piece of insulation **12 inches** and wider in width.

E. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings in accordance with ASTM C518.

2.2 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION (XPS)

A. Extruded Polystyrene Board Insulation, Type IV: ASTM C578, Type IV, **25 psi** minimum compressive strength; unfaced.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. DuPont de Nemours, Inc.
b. Kingspan Insulation LLC
c. Owens Corning
d. The Dow Chemical Company

2. Basis-of-Design Product: Subject to compliance with requirements, provide <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:

a. DuPont de Nemours, Inc.
b. Kingspan Insulation LLC

c. Owens Corning
d. The Dow Chemical Company

2.3 MINERAL-WOOL BLANKET INSULATION

A. Mineral-Wool Blanket Insulation, Reinforced-Foil Faced: ASTM C665, Type III (reflective faced); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

2.4 LOOSE-FILL INSULATION

A. Mineral-Fiber Loose-Fill Insulation: ASTM C764, Type I for pneumatic application.

1. Manufacturers: Subject to compliance with requirements, **available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**:

a. **Knauf Insulation**
b. **Owens Corning**

2.5 INSULATION FASTENERS

A. Insulation Fastener Accessories: Provide double-pointed weld pins, lagging pins, quilting pins, duct liner pins, insulation hangers, specialty washers, special caps, j-hooks, capacitor discharge annular weld pins, capacitor discharge acoustical lagging pins, and other accessory materials that are recommended in writing by insulation fastener manufacturer to produce complete insulation supports.

2.6 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

B. Miscellaneous Application Accessories:

1. Crack Sealer: Closed-cell insulating foam in aerosol dispenser recommended in writing by insulation manufacturer for filling gaps in board insulation.
2. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.
3. Tapes for Reflective Insulation and Barriers:

a. Aluminum-foil tape for repairs or splicing material.

b. Double-sided tape for adhering to metal framing or overlapping material.
c. Reinforced-foil tape for sealing tears or cuts in sheet vapor barrier.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or those that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products, applications and applicable codes.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Install insulation with manufacturer's R-value label exposed after insulation is installed.

D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF SLAB INSULATION

A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive in accordance with manufacturer's written instructions.

1. If not otherwise indicated, extend insulation a minimum of 36 inches below exterior grade line.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive in accordance with anchor manufacturer's written instructions.

2. Space anchors in accordance with insulation manufacturer's written instructions for insulation type, thickness, and application.
3. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
4. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
5. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing in accordance with manufacturer's written instructions.

3.5 INSTALLATION OF CAVITY-WALL INSULATION

A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately **24 inches** o.c. both ways on inside face and as recommended in writing by manufacturer.

1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
2. Press units firmly against inside substrates.

3.6 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members in accordance with the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain **3-inch** clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed **96 inches**, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
6. Where glass-fiber blankets are indicated for sound attenuation above ceilings, install unfaced blanket insulation over ceiling area in thickness indicated. Where partitions occur, extend insulation up either side of partition.
7. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.

    a. Exterior Walls: Set units with facing placed toward interior of construction.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where

required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately **2.5 lb/cu. ft.**.

3.7 INSTALLATION OF BOARD INSULATION

A. Install board insulation in accordance with manufacturer's written instructions per project applications and conditions.

3.8 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. High-build air barriers, vapor retarding.

1.2 DEFINITIONS

A. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.

B. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

C. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.4 ACTION SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.

1. High-build air barriers, vapor retarding.
2. High-build air barriers, vapor permeable.
3. Medium-build air barriers, vapor retarding.
4. Medium-build air barriers, vapor permeable.
5. Low-build air barriers, vapor retarding.
6. Low-build air barriers, vapor permeable.

B. Shop Drawings: For air-barrier assemblies.

1. Show locations and extent of air-barrier materials, accessories, and assemblies

specific to Project conditions.
2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.

C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1. Installer to be licensed by ABAA in accordance with ABAA's Quality Assurance Program and to employ ABAA-certified installers and supervisors on Project.

B. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.

1. Build integrated mockups of exterior wall assembly per Masonry mockups, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

a. Coordinate construction of mockups to permit inspection and testing of air barrier before external insulation and cladding are installed.
b. Include junction with roofing membrane, building corner condition,.
c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Protect stored materials from direct sunlight.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.

1. Protect substrates from environmental conditions that affect air-barrier performance.
2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain primary air-barrier materials and air-barrier accessories from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction to be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies to be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested in accordance with ASTM E2357.

C. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. pressure difference; ASTM E2178.

D. Ultimate Elongation: Minimum 200 percent; ASTM D412, Die C.

E. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested in accordance with ASTM D4541.

F. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

G. UV Resistance: Can be exposed to sunlight for 30 days in accordance with

manufacturer's written instructions.

2.3 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING

A. High-Build, Vapor-Retarding Air Barrier, Synthetic Polymer Type: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of **35 mils** or thicker over smooth, void-free substrates.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Carlisle Coatings & Waterproofing Inc
b. Tremco Commercial Sealants and Waterproofing, part of Tremco CPG
c. W. R. Meadows, Inc

2. Basis-of-Design Product: Subject to compliance with requirements, provide <**Insert manufacturer's name; product name or designation**> or comparable product by one of the following:

a. Carlisle Coatings & Waterproofing Inc
b. Tremco Commercial Sealants and Waterproofing, part of Tremco CPG
c. W. R. Meadows, Inc

B. Vapor Permeance: Maximum 0.1 perm; ASTM E96/E96M, Procedure A, Desiccant Method.

2.4 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

A. Vapor Permeance: Minimum 5 perms; ASTM E96/E96M, Procedure A, Desiccant Method.

2.5 ACCESSORY MATERIALS

A. Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, 0.0187 inch thick, and Series 300 stainless steel fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates for capillary moisture by plastic sheet method in accordance with ASTM D4263.
4. Verify that masonry joints are flush and completely filled with mortar.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate in accordance with manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.

B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.

F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

H. Bridge expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement in accordance with manufacturer's written instructions and details.

3.3 INSTALLATION OF ACCESSORIES

A. Install accessory materials in accordance with air-barrier manufacturer's written

instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.

1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
2. Install transition strip on roofing membrane or base flashing so that a minimum of **3 inches** of coverage is achieved over each substrate.
3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.

D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply preformed silicone extrusion so that a minimum of **3 inches** of coverage is achieved over each substrate. Maintain **3 inches** of full contact over firm bearing to perimeter frames, with not less than **1 inch** of full contact.

1. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.

F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.

G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.

H. Seal top of through-wall flashings to air barrier with an additional **6-inch-** wide, transition strip.

I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending **6 inches** beyond repaired areas in strip direction.

3.4 INSTALLATION OF PRIMARY AIR-BARRIER MATERIAL

A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier in accordance with air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.

1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.

1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.

C. Do not cover air barrier until it has been tested and inspected by testing agency.

D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
2. Air-barrier dry film thickness.
3. Continuous structural support of air-barrier system has been provided.
4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
5. Site conditions for application temperature and dryness of substrates have been maintained.
6. Maximum exposure time of materials to UV deterioration has not been exceeded.
7. Surfaces have been primed, if applicable.
8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.

9. Termination mastic has been applied on cut edges.
10. Strips and transition strips have been firmly adhered to substrate.
11. Compatible materials have been used.
12. Transitions at changes in direction and structural support at gaps have been provided.
13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
14. All penetrations have been sealed.

D. Tests: As determined by testing agency from among the following tests:

1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage in accordance with ASTM E1186, chamber pressurization or depressurization with smoke tracers.
2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate in accordance with ASTM E783.
3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate in accordance with ASTM D4541 for each 600 sq. ft. of installed air barrier or part thereof.

E. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, in accordance with manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

G. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Protect air-barrier system from damage during application and remainder of construction period, in accordance with manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials in accordance with air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

C. Remove masking materials after installation.

END OF SECTION 07 27 26

SECTION 07 41 13.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. This section is used only for Brine Equipment building. All other buildings to reference Sections 074116 "Insulated Metal Roof Panels" and 133419 "Metal Building Systems

B. Section Includes:

1. Vertical-rib, seamed-joint, standing-seam metal roof panels.
2. Roof insulation.
3. Underlayment.
4. Note- metal roof, wall, liner, and soffit panel systems along with all accessories, trim, fascia, downspouts, gutters, etc. shall be obtained from the same manufacturer for each system for all project buildings which use these systems as much as possible – see also metal building systems-section 133419. Profiles and colors are to match what is provided for metal building systems.

C. Related Requirements:

1. Section 074116 "Insulated Metal Roof Panels" for roof panel information for reference/matching and manufacturers
2. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.
3. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.
4. Section 133419 "Metal Building Systems" for reference/matching and manufacturers.

1.2 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal roof panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. For standing-seam metal roof panels. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches**.

C. Samples for Initial Selection: Manufacturer's standard color charts, showing full range of available colors for each type of exposed finish.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish for metal roof panels and metal panel accessories.

1. Size: Manufacturers' standard size.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates for portable roll-forming equipment.

B. Product Test Reports: For standing-seam metal roof panels, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Qualification Statements: For roof installers.

E. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal roof panels.

1.6 QUALITY ASSURANCE

A. Roof Installer Qualifications:Experienced Installer with minimum of five years' experience with successfully completed projects of a similar nature and scope. Installer Entity employs a supervisor who is an NRCA ProCertified Roofing Foreman supervising work on site whenever work is underway.

B. Portable Roll-Forming Equipment Certification: UL-certified, portable roll-forming equipment capable of producing metal roof panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.

B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal roof panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness, with positive slope for drainage of water. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal roof panels during installation.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roof panels to be performed in accordance with manufacturers' written installation instructions and warranty requirements.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal roof panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metal and other materials beyond normal weathering.

2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertightness Warranty: Manufacturer agrees to repair or replace standing-

seam metal roof panel systems that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal roof panel systems capable of withstanding the effects of the following loads when tested in accordance with ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings Snow Loads: 25lbf/sq. ft.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than **0.023 cfm/sq. ft.** when tested in accordance with ASTM E1680 at the following test-pressure difference:

1. Test-Pressure Difference: 12 lbf/sq/ft.

C. Water Penetration under Static Pressure: No water penetration when tested in accordance with ASTM E1646 at the following test-pressure difference:

1. Test-Pressure Difference: 20 lbf/sq. ft.

D. Watertightness: No water penetration when tested in accordance with ASTM E2140 for hydrostatic-head resistance.

E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 30.

F. FM Approvals Listing: Provide metal roof panels and component materials that comply with requirements in FM Approvals 4471 as part of a metal panel roofing system and that are listed in FM's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: Class 1A-.
2. Hail Resistance: SH.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STANDING-SEAM METAL ROOF PANELS, GENERAL

A. Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with seamed joint type indicated and mechanically attaching panels to supports using concealed fasteners in side laps. Include all accessories required for weathertight installation.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than <**Insert number**> percent.

2.3 VERTICAL-RIB, SEAMED-JOINT, STANDING-SEAM METAL ROOF PANELS

A. Manufacturers; Subject to compliance with requirements, provide product by same manufacturer providing insulated metal roof panels. Basis of design is Nucor Building Systems.

B. Metal Roof Panels: Formed with vertical ribs at panel edges; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.

1. Structural Support: Over solid deck.
2. Material: Metallic-coated steel.
3. Seam Type: Manufacturer's standard.
4. Panel Profile: Intermediate stiffening ribs symmetrically spaced between ribs Mesa Profile.
5. Panel Coverage: 16 inches.
6. Panel Height: 2.0 inches.
7. Clips: Two piece, floating, designed to accommodate thermal movement.

a. Steel Clips: 0.028-inch- nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
b. Clip Spacing: As indicated on approved Shop Drawings.

2.4 METAL ROOF PANEL MATERIAL

A. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with minimum ASTM A653/A653M, **G90** coating designation, or aluminum-zinc alloy-coated steel sheet complying with minimum ASTM A792/A792M, **Class AZ50** coating designation; structural quality. Sheet prepainted by the coil-coating process to comply with ASTM A755/A755M.

1. Nominal Thickness: 24 ga min.
2. Surface: Smooth, flat texture.
3. Exterior Finish: Two-coat fluoropolymer.
4. Color: Spruce.

B. Rubberized-Asphalt-Sheet Vapor Retarder, Self-Adhering: ASTM D1970/D1970M polyethylene film laminated to layer of rubberized asphalt adhesive, minimum **40-mil**

total thickness; maximum permeance rating of **0.1 perm**; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

C. Butyl Rubber Sheet Vapor Retarder, Self-Adhering: Polyethylene film laminated to layer of butyl rubber adhesive, minimum **30-mil** total thickness; maximum permeance rating of **0.1 perm**; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.

2.5 ROOF INSULATION

A. Insulation over Open Framing:

1. Mineral-Fiber-Blanket Insulation: ASTM C665, type indicated below; consisting of fibers manufactured from glass, slag wool, or rock wool.

a. Reflective Faced: Type III (blankets with reflective membrane covering), Category 1 (membrane is a vapor retarder), Class A (membrane-faced surface with a flame-spread index of 25 or less).

2.6 UNDERLAYMENT

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of **30 mils** thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ATAS International, Inc.
b. Owens Corning
c. Polyglass U.S.A., Inc.

2. Thermal Stability: Stable after testing at **240 deg F**; ASTM D1970/D1970M.
3. Low-Temperature Flexibility: Passes after testing at **minus 20 deg F**; ASTM D1970/D1970M.

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.7 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645; cold-formed, metallic-coated steel sheet, minimum ASTM A653/A653M, **G90** hot-dip galvanized coating designation or ASTM A792/A792M, **Class AZ50** coating designation. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Roof Panel Accessories: Provide components required for a complete, weathertight metal roof panel system including trim, copings, fasciae, mullions, sills, corner units, fasteners, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
2. Backing Plates: Provide metal backing plates at roof panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal roof panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

D. Gutters: Formed from same material as metal roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **96-inch-** long sections, of size and metal thickness in accordance with manufacturer's recommendations. Furnish gutter supports spaced a maximum of **36 inches** o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.

E. Downspouts: Formed from same material as metal roof panels. Fabricate in **10 ft.** long sections, complete with formed elbows and offsets, of size and metal thickness in accordance with manufacturer's recommendations. Finish downspouts to match gutters.

F. Roof Panel Fasteners: Self-tapping screws designed to withstand design loads.

G. Roof Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with metal roof panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch** wide and **1/8 inch** thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.8 FABRICATION

A. Fabricate and finish metal roof panels and accessories at the factory, by

manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide roof panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal roof panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for other than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with manufacturer's recommendations.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not permitted on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal roof panel manufacturer.

    a. Size: As recommended by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.9 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Roof Panels and Accessories:

1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than **0.20 - 0.25 mil** for primer and **0.7 - 0.8 mil** for topcoat.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-

colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil**.

D. Aluminum Roof Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal roof panel manufacturer's written installation instructions.

3.3 INSTALLATION OF UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than **6 inches** staggered **24 inches** between courses. Overlap side

edges not less than **3-1/2 inches**. Extend underlayment into gutter trough. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

B. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.

C. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 INSTALLATION OF STANDING-SEAM METAL ROOF PANELS

A. Install metal roof panels in accordance with manufacturer's written installation instructions and approved Shop Drawings in orientation, sizes, and locations indicated. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal roof panels.
2. Flash and seal metal roof panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal roof panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal roof panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal roof panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Roof Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Roof Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Stainless Steel Roof Panels: Use stainless steel fasteners.
4. Copper Roof Panels: Use copper, stainless steel, or hardware-bronze fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal roof panel manufacturer.

D. Concealed Clip, Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.

2. Install pressure plates at locations indicated in manufacturer's written installation instructions.

E. Roof Panel Joints: Fasten panel joints to substrate in accordance with manufacturer's instructions.

1. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
2. Watertight Installation:

a. Apply a continuous ribbon of sealant or tape to seal joints of metal roof panels, using sealant or tape as recommended in writing by manufacturer as needed to make panels watertight.
b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
c. At panel splices, nest panels with minimum **6-inch** end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.

G. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 ft.** with no joints allowed within **24 inches** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).

H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than **36 inches** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold

downspouts securely **1 inch** away from walls; locate fasteners at top and bottom and at approximately **60 inches** o.c. in between.

1. Connect downspouts to underground drainage system indicated.

J. Pipe and Conduit Penetrations: Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panels within installed tolerance of **1/4 inch in 20 ft.** on slope and location lines as indicated and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13.16

SECTION 07 41 16 - INSULATED METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standing-seam-profile, foamed-insulation-core metal roof panels.

B. Related Requirements:

1. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.2 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal roof panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, insulated metal roof panel Installer, insulated metal roof panel manufacturer's technical representative, inspection agency, structural-support Installer, and installers whose work interfaces with or affects insulated metal roof panels, including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to insulated metal roof panel installation, including manufacturer's written installation instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review structural loading limitations of purlins and rafters during and after roofing.
6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect insulated metal roof panels.
7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
8. Review temporary protection requirements for insulated metal roof panel systems

during and after installation.
9. Review procedures for repair of insulated metal roof panels damaged after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data:

1. For insulated metal roof panels.

a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of insulated metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches**.

C. Samples for Initial Selection: Manufacturer's standard color charts, showing full range of available colors for each type of exposed finish.

1. Include similar Samples of trim,accessories, and sealants involving color selection.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish for insulated metal roof panels, clips, fasteners, closures, and other insulated metal roof panel accessories.

1. Size: Metal Panels: 12 inches (305 mm) long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories..
2. Provide color chip verifying color selection.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For insulated metal roof panels, for tests performed by a qualified testing agency indicating compliance of products with requirements.

B. Qualification Statements: For roof installers and Installer’s field supervisor.

C. Accreditation Certificate: Indicating that manufacturer is accredited under an accredited third-party quality control program, including IAS AC472 and based upon chapter 17 of the International Building Code (IBC).

D. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For insulated metal roof panels.

B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

1.7 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer approved under an accredited third-party quality control program

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum ten years' experience in the manufacturing of similar products and successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data including certified independent test data indicating compliance with requirements.
b. Samples of each component.
c. Sample submittal from similar project.
d. Project references: Minimum of five installations not less than five years old, with Owner and Architect contact information.
e. Sample warranty.
f. Certificate from an accredited third-party Quality Control Program.

2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements
3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Roof Installer Qualifications:Experienced Installer with minimum of five years' experience with successfully completed projects of a similar nature and scope. Installer employs a supervisor who is an NRCA ProCertified Roofing Foremansupervising work on site whenever work is underway.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, insulated metal roof panels, and other manufactured items so as not to be damaged or deformed. Package insulated metal roof panels for protection during transportation and handling.

B. Unload, store, and erect insulated metal roof panels in a manner to prevent bending, warping, twisting, and surface damage. Store in accordance with Manufacturer's written instructions.

C. Provide wood collars for stacking and handling in the field. Stack insulated metal roof panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store insulated metal roof panels to ensure dryness, with positive

slope for drainage of water. Do not store insulated metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on insulated metal roof panels during installation.

E. Shield foam insulated metal panels from direct sunlight until installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of insulated metal roof panels to be performed in accordance with manufacturers' written installation instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of insulated metal roof panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer agrees to repair finish or replace insulated metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertightness Warranty: Manufacturer agrees to repair or replace insulated metal roof panel systems that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide insulated metal roof panel systems capable of withstanding the effects of the following loads when tested in accordance with ASTM E72:

1. Wind Loads:Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on Drawings.
2. Other Design Loads: As indicated on Drawings Snow Loads: 25lbf/sq. ft.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
4. <**Insert performance requirements**>.

B. Air Infiltration: Air leakage of not more than **0.023 cfm/sq. ft.** when tested in accordance with ASTM E1680 at the following test-pressure difference:

1. Test-Pressure Difference: 12 lbf/sq. ft.

C. Water Penetration under Static Pressure: No water penetration when tested in accordance with ASTM E1646 at the following test-pressure difference:

1. Test-Pressure Difference: 20lbf/sq. ft.

D. Test procedure for susceptibility to leakage of discontinuous roof systems protocol TAS 114: Water applied to a depth of 6” above the lowest section of roof profile. No water infiltration observed during the seven-day test period.

E. FM Approvals Listing: Provide insulated metal roof panels and component materials that comply with requirements in FM Approvals 4471 as part of a metal panel roofing system and that are listed in FM's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: As required per structural drawings.
2. Hail Resistance: SH.

F. Fire Performance Characteristics: Provide metal panel systems with the following fire-test characteristics determined by indicated test standard as applied by UL or other testing and inspection agency acceptable to authorities having jurisdiction.

1. Surface-Burning Characteristics: Provide metal panel systems with the following characteristics when tested per ASTM E 84. The core shall have:

a. a. Flame spread index: 25 or less.
b. Smoke developed index: 450 or less

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

H. Energy Performance:

1. Roof Panel Radiative Property Performance: 1. Energy Star Qualified: Listed on USDOE ENERGY STAR Roof Products Qualified Product List.

2.2 INSULATED METAL ROOF PANELS, GENERAL

A. Provide factory-formed metal roof panels fabricated from two sheets of metal with insulation core foamed in place during fabrication with joints between panels designed to form weathertight seals. Include all accessories required for weathertight installation.

1. Metal Roof Panel Performance:

a. Flatwise Tensile Strength: **30 psi** when tested in accordance with ASTM C297/C297M.
b. Humid Aging: Volume increase not greater than 6.0 percent and no delamination or metal corrosion when tested for seven days at **140 deg F** and 100 percent relative humidity in accordance with ASTM D2126.
c. Heat Aging: Volume increase not greater than 2.0 percent and no delamination, surface blistering, or permanent bowing when tested for seven days at **200 deg F** in accordance with ASTM D2126.
d. Cold Aging: Volume decrease not more than 1.0 percent and no delamination, surface blistering, or permanent bowing when tested for seven days at **minus 20 deg F** in accordance with ASTM D2126.
e. Fatigue: No evidence of delamination, core cracking, or permanent bowing when tested to a **20 lbf/sq. ft.** positive and negative wind load and with deflection of L/180 for 2 million cycles.
f. Autoclave: No delamination when exposed to **2 psi** pressure at a temperature of **212 deg F** for 2-1/2 hours.
g. Fire-Test-Response Characteristics: Class A in accordance with ASTM E108.

2. Insulation Core Foam: Foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.

a. Closed-Cell Content: 90 percent when tested in accordance with ASTM D6226.
b. Density: **2.0 lb/cu. ft. minimum** when tested in accordance with ASTM D1622.
c. Compressive Strength: Minimum **15 psi** when tested in accordance with ASTM D1621.
d. Shear Strength: **26 psi** when tested in accordance with ASTM C273/273M.

2.3 STANDING-SEAM-PROFILE, FOAMED-INSULATION-CORE METAL ROOF PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide CFR Insulated Metal Panel by Metl-Span; a Nucor Brand or comparable product by one of the following:

1. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
2. ATAS International, Inc.

B. Insulated Metal Roof Panels: Vertical ribs along one side of exterior face sheets are mechanically seamed on-site with vertical ribs of adjacent exterior face sheets. Concealed clips in the seams are anchored to supports by screws through the interior face sheet. Interior face sheets provide a tongue-and-groove interlock at joints.

1. Panel Coverage: 42 inches.
2. Panel Thickness: 4.0 inches.
3. Exterior Face Sheet:

    a. Material: Metallic-coated steel sheet.
    b. Nominal Thickness: 0.022 inch .
    c. Texture: Embossed.
    d. Finish: Siliconized polyestertwo coat system.
    e. Color: Spruce.

4. Interior Face Sheet:

    a. Material: Metallic-coated steel sheet.
    b. Nominal Thickness: 0.022 inch .
    c. Texture: Embossed.
    d. Finish: Acrylic or polyestertwo coat system.
    e. Color: Igloo White.
    f. Profile: Planked.

5. Insulation Core: polyurethane foam.
6. Thermal-Resistance Value (R-Value): 30 in accordance with ASTM C1363.
7. Clips: Manufacturer's standard clips to accommodate thermal movement.

    a. Clip Size and Spacing: As indicated on approved Shop Drawings.

2.4 INSULATED METAL ROOF PANEL FACING MATERIAL

A. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, **G90** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, **Class AZ50** coating designation; structural quality. Sheet prepainted by the coil-coating process to comply with ASTM A755/A755M.

2.5 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, minimum ASTM A653/A653M, **G90** coating designation or ASTM A792/A792M, **Class AZ50** coating designation. Provide manufacturer's standard sections as required for support and alignment of insulated metal roof panel system.

B. Roof Panel Accessories: Provide components required for a complete, weathertight metal roof panel system, including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of insulated metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as insulated metal roof panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match insulated metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as exterior facings of insulated metal roof panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent insulated metal roof panels.

D. Gutters: Formed from same material, finish, and color as exterior facings of insulated metal roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **96-inch-** long sections, of size and metal thickness in accordance with manufacturer's recommendations. Furnish gutter supports spaced a maximum of **36 inches** o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match roof fascia and rake trim.

E. Downspouts: Formed from same material, finish, and color as exterior facings of insulated metal roof panels. Fabricate in **10 ft.-** long sections, complete with formed elbows and offsets, of size and metal thickness in accordance with manufacturer's recommendations. Finish downspouts to match gutters.

F. Roof Curbs: Fabricated from same material, finish, and color as exterior facings of insulated metal roof panels, 0.048-inch nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of **0.060-inch-** nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.

1. Insulate roof curb with **1-inch-** thick, rigid insulation.

G. Roof Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide EPDM or PVC sealing washers for exposed fasteners.

1. Galvanized-Steel Fasteners: Provide exposed fasteners with heads matching color of insulated metal roof panels by means of plastic caps or factory-applied coating.

H. Roof Panel Sealants: Provide sealant types recommended by manufacturer that are

compatible with metal roof panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch** wide and **1/8 inch** thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in insulated metal roof panels and remain weathertight; and as recommended in writing by insulated metal roof panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.6 FABRICATION

A. Fabricate and finish insulated metal roof panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide insulated metal roof panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate insulated metal roof panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with manufacturer's recommendations.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by insulated metal roof panel manufacturer.

    a. Size: As recommended by insulated metal roof panel manufacturer for application but not less than thickness of metal being secured.

2.7 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Exterior Metal Roof Panel Facings and Accessories:

1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than **0.20 - 0.25 mil** for primer and **0.7 - 0.8 mil** for topcoat.

D. Interior Metal Roof Panel Facings:

1. Acrylic or Polyester Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester finish consisting of 0.20 – 0.25 mil prime coat and **0.7 - 0.8 mil** color coat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, insulated metal roof panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

B. Examine roughing-in for components and systems penetrating insulated metal roof panels to verify actual locations of penetrations relative to seam locations of insulated metal roof panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and insulated metal roof panel manufacturer's written recommendations.

3.3 INSTALLATION OF INSULATED METAL ROOF PANELS

A. General: Install insulated metal roof panels in accordance with manufacturer's written instructions and approved Shop Drawings in orientation, sizes, and locations indicated on Drawings. Anchor insulated metal roof panels and other components of the Work

securely in place, with provisions for thermal and structural movement.

1. Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal roof panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.
2. Shim or otherwise plumb substrates receiving insulated metal roof panels.
3. Flash and seal insulated metal roof panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by insulated metal roof panels are installed.
4. Install screw fasteners in predrilled holes.
5. Locate and space fastenings in uniform vertical and horizontal alignment.
6. Install flashing and trim as insulated metal roof panel work proceeds.
7. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
8. Align bottoms of insulated metal roof panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
9. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners: Use galvanized-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Anchor Clips: Anchor insulated metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners in accordance with manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by insulated metal roof panel manufacturer.

E. Lap-Seam, Foamed-Insulation-Core Metal Roof Panels: Fasten insulated metal roof panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full-rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or applications not true to line.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of insulated metal roof panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Provide sealant tape at lapped joints of insulated metal roof panels and between panels and protruding equipment, vents, and accessories.
5. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to weatherproof panels.

F. Standing-Seam, Foamed-Insulation-Core Metal Roof Panels: Fasten insulated metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so cleat, insulated metal roof panel, and factory-applied side-lap sealant are completely engaged.

G. Batten-Seam, Foamed-Insulation-Core Metal Roof Panels: Fasten insulated metal roof panels to supports with concealed clips at each batten-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.

1. Apply caps to insulated metal roof panel seams, fully engaged to provide weathertight joints.

H. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal joints of insulated metal roof panels, using sealant or tape as recommend by manufacturer as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.

I. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete insulated metal roof panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by insulated metal panel manufacturers; or, if not indicated, provide types recommended in writing by metal roof panel manufacturer.

J. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 ft.** with no joints allowed within **24 inches** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).

K. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than **36 inches** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

L. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch** away from walls; locate fasteners at top and bottom and at approximately **60 inches** o.c. in between.

1. Connect downspouts to underground drainage system indicated.

M. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

N. Pipe and Conduit Penetrations: Fasten and seal to metal roof panels as recommended by manufacturer.

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as insulated metal roof panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of insulated metal roof panel installation, clean finished surfaces as recommended by insulated metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Replace insulated metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 16

SECTION 07 42 13.19 - INSULATED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Foamed-insulation-core metal wall panels.

B. Related Requirements:

1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's technical representative, inspection agency, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Foamed-insulation-core metal wall panels.

B. Product Data Submittals: For each product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

a. Include data indicating compliance with performance requirements.
b. Indicate points of supporting structure that must coordinate with metal panel system installation.
c. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.

2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than **1-1/2 inches per 12 inches**Make distinctions between factory and field assembled work.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim, accessories, and sealants involving color selection.

E. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.

1. Metal Panels: **12 inches** long by actual panel width. Include fasteners, closures, and other metal panel accessories. Provide color chip verifying color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Installer's field supervisor.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

C. Accreditation Certificate: Indicating that manufacturer is accredited under an accredited third-party Quality Control Program, including IAS AC472 and based upon chapter 17 of the International Building Code (IBC).

D. Field quality-control reports.

E. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer approved under an accredited third-party quality control program.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum ten years' experience in the manufacturing of similar products and successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.
b. Samples of each component.
c. Sample submittal from similar project.
d. Project references. Minimum of five installations not less than five years old, with Owner and Architect contact information.
e. Sample warranty.
f. Certificate from an accredited third-party Quality Control Program.

C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years' experience with successfully completed projects of a similar nature and scope. Installer employs a field Supervisor certified by metal panel manufacturer supervising work on site whenever work is underway.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Store in accordance with Manufacturer's written instructions.

F. Shield foam insulated metal panels from direct sunlight until all components are installed.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted

weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E72:

1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on Drawings.

a. Wind Negative Pressure: Certify capacity of metal panels by testing of proposed assembly

2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection no greater than 1/180 of the span with no evidence of failure.
4. <**Insert serviceability requirements**>.

B. Air Infiltration, Test in accordance with ASTM E283, air leakage maximums per the following:

1. Maximum 0.0002 cfm/sq. ft. at static air pressure difference of 1.57 lbf/sq. ft.
2. Maximum 0.0009 cfm/sq. ft. at static-air-pressure difference of 6.24 lbf/sq. ft.
3. Maximum 0.01 cfm/sq. ft. at static-air-pressure difference of 20 lbf/sq. ft.

C. Water Penetration under Static Pressure, no uncontrolled water penetration when tested under the following parameters

1. ASTM E 331, No uncontrolled water penetration at a static pressure of 20 lbf/sq. ft.
2. ASTM E 331 Modified (2-hour duration), No uncontrolled water penetration at a static pressure of 6.24 lbf/sq. ft.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

E. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E119.
2. Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which wall panel is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies.
3. Radiant Heat Exposure: No ignition when tested in accordance with NFPA 268.
4. Potential Heat: Acceptable level when tested in accordance with NFPA 259.
5. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E84.
6. Room Test Performance, FM Global 4880: The panel assembly shall not support a self-propagating fire which reaches any limits of the 50’ high corner test structure as evidenced by flaming or material damage of the ceiling of the assembly.
7. Fire Growth, The fire assembly shall meet the requirements of the standard for

NFPA 286

8. IBC Chapter 26, Panel Performance under the above test methods, shall meet the requirements of IBC, Chapter on foam plastics

F. Thermal Performance, When tested in accordance with ASTM C 518, Measurement of Steady State thermal Transmission, the panels shall provide a k factor of 0.14 btu/sf/hr/deg F at a 75° F mean temperature, as required by code, or 0.126 btu/sf/hr/deg F at a 40° F mean temperature

G. FM Approvals Listing, Comply with FM Approval 4881. Provide metal wall panel assembly listed in FM Approvals' "Approval Guide."

2.2 FOAMED-INSULATION-CORE METAL WALL PANELS

A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.

   a. Closed-Cell Content: 90 percent when tested in accordance with ASTM D6226.
   b. Density: **2.0 lb/cu. ft. minimum** when tested in accordance with ASTM D1622.
   c. Compressive Strength: Minimum **15 psi** when tested in accordance with ASTM D1621.
   d. Shear Strength: **26 psi** when tested in accordance with ASTM C273/C273M.

B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels: Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.

1. Basis-of-Design Product: Subject to compliance with requirements, provide CF Flute by Metl-Span; a Nucor Brand or comparable product by one of the following:

   a. CENTRIA, a Nucor Brand
   b. Kingspan Insulated Panels, Inc.
   c. MBCI; Cornerstone Building Brands
   d. ATAS International, Inc.

2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, **G90** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, **Class AZ50** coating designation; structural quality. Prepainted by the coil-coating process to comply

with ASTM A755/A755M.

a. Nominal Thickness: 0.022 inch.
b. Exterior Finish: Siliconized polyester.

1) Color: Almond.
2) Texture: Stucco Embossed.

c. Interior Finish: Polyester two-coat system.

1) Color: Igloo White.
2) Texture: Stucco Embossed
3) Profile: Light Mesa.

3. Snap-on Batten: Same material, finish, and color as exterior facings of wall panels.
4. Panel Coverage: 42 inches nominal.
5. Panel Thickness: 4.0 inches.
6. Thermal-Resistance Value (R-Value): 30 in accordance with ASTM C1363.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, **G90** coating designation or ASTM A792/A792M, **Class AZ50** aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps

or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch** wide and **1/8 inch** thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.
4. Vertical Joint Gasket: Manufacturers standard EPDM gasket. Color: custom color to match wall panel

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than **0.2 - 0.25mil** for primer and **0.7 - 0.8 mil** for topcoat.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of 0.20 – 0.25 mil prime coat and 0.7 - 0.8 mil color coat.

D. Aluminum Panels and Accessories:

1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than **0.2 - 0.25 mil** for primer and **0.7 - 0.8 mil** for topcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer but not greater than the following.

a. 1/4 inch in 20 foot in any direction.
b. 3/8 inch over any single wall plane.
c. Girt Spacing 8 feet or more: 1/4 inch out only.
d. Girt Spacing Less Than 8 feet: 1/8 inch out only.
e. CF Architectural girt spacing less than 4 feet: 1/16 inch out only.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

A. General: Install metal panels in accordance with manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.

1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 INSTALLATION OF INSULATION-CORE METAL WALL PANELS

A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.

1. Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.
2. Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
3. Provide metal-backed washers under heads of exposed fasteners on weather side of insulated metal wall panels.
4. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
5. Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.
6. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.
7. Apply snap-on battens to exposed-fastener, insulated-core metal wall panel seams to conceal fasteners.

B. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.

1. Install clips to supports with self-tapping fasteners.

C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 feet** with no joints allowed within **24 inches** of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration in accordance with AAMA 501.2.

C. Metal wall panels will be considered defective if they do not pass test and inspections.

D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

E. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 42 13.19

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Custom flashing and trim fabrications, made from the following:

1. Sheet metal materials.
2. Underlayment.
3. Miscellaneous materials.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 042000 "Unit Masonry" for installation of manufactured sheet metal through-wall flashing and trim integral with masonry.
3. Section 074113.16 "Standing-Seam Metal Roof Panels" for installation of sheet metal flashing and trim integral with roofing at Brine Building.
4. Section 074213.19 "Insulated Metal Wall Panels" for sheet metal flashing and trim integral with metal wall panels.
5. Section 077100 "Roof Specialties" for manufactured copings, roof-edge specialties, roof-edge drainage systems, reglets, and counterflashings.
6. Section 077200 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.
7. Section 079200 "Joint Sealants" for sealants and caulking.
8. Section 133419 "Metal Building Systems" for material and manufacturer reference.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Plans, elevations, sections, and attachment details.
2. Fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Identification of material, thickness, weight, and finish for each item and location in Project.
4. Details for forming, including profiles, shapes, seams, and dimensions.
5. Details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Details of termination points and assemblies.
7. Details of special conditions.
8. Details of connections to adjoining work.
9. Formed flashing and trim at scale of not less than **1-1/2 inches per 12 inches**.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish for sheet metal and other metal accessories.

1. Sheet Metal Flashing and Trim: Manufacturers' standard size. Include finished seam with required profile. Include fasteners, cleats, clips, closures, and other attachments.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

B. Research Reports: For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI/FM 4435/ES-1.

C. Qualification Statements: For fabricator.

D. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Entity that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Installer Qualifications: Entity that employs a supervisor who is an NRCA ProCertified Roofing Foremansupervising work on site whenever work is underway.

C. For roof edge flashings and copings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop is to be listed as able to fabricate required details as tested and approved.

D. Quality Standard: SMACNA’s “Architectural Sheet Metal Manual”.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

2. Protect stored sheet metal flashing and trim from contact with water.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.7 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install roof edge flashings and copings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METAL MATERIALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with minimum ASTM A653/A653M, **G90** coating designation, or aluminum-zinc alloy-coated steel sheet complying with minimum ASTM A792/A792M, **Class AZ50** coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

1. Nominal Thickness: 24-guage or specified herein.
2. Surface: Smooth, flat.
3. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Color: Match Architect's sample.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of **0.5 mil**.

C. Aluminum Sheet: Coil-coated sheet, ASTM B209/B209M, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

1. Thickness: 0.050 inch.
2. Surface: Smooth, flat.
3. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

4. Color: As selected by Architect from manufacturer's full range.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of **0.5 mil**.

2.3 UNDERLAYMENT

A. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Slip Sheet: Rosin-sized building paper, **3 lb/100 sq. ft.** minimum, of type required for application.

2.4 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

   a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
   b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
   c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape **1/2 inch** wide and **1/8 inch** thick.

D. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including

riveted joints.

G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.

H. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of **1/4 inch in 20 ft.** on slope and location lines indicated on Drawings and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

H. Do not use graphite pencils to mark metal surfaces.

2.6 WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum **96-inch-** long, but not exceeding **12 ft.** long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend **6 inches** beyond each side of wall openings; and form with **2-inch-** high, end dams. Fabricate from the following materials:

1. Stainless Steel: 0.0156 inch thick.
2. Zinc: 0.032 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrates, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF SHEET METAL FLASHING AND TRIM, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings. Install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim

system.

2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds sealant.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
5. Install continuous cleats with fasteners spaced not more than **12 inches** o.c.
6. Space individual cleats not more than **12 inches** apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
8. Do not field cut sheet metal flashing and trim by torch.
9. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 ft. with no joints within **24 inches** of corner or intersection.
2. Form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with sealant concealed within joints.
3. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.

    a. Embed hooked flanges of joint members not less than **1 inch** into sealant.
    b. Form joints to completely conceal sealant.
    c. When ambient temperature at time of installation is between **40 and 70 deg F**, set joint members for 50 percent movement each way.
    d. Adjust setting proportionately for installation at higher ambient

temperatures.

1) Do not install sealant-type joints at temperatures below **40 deg F**.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 INSTALLATION OF WALL SHEET METAL FABRICATIONS

A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

C. Reglets: Installation of reglets is specified in Section 042000 "Unit Masonry." Section <**Insert Section number**> "<**Insert Section title**>."

3.4 INSTALLATION OF MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing:

1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
2. Weld or seal flashing with elastomeric sealant to equipment support member.

B. Overhead-Piping Safety Pans:

1. Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings.
2. Pipe and install drain line to plumbing waste or drainage system.

3.5 INSTALLATION TOLERANCES

A. Shim and align sheet metal flashing and trim within installed tolerance of **1/4 inch in 20 ft.** on slope and location lines indicated on Drawings and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING

A. Clean off excess sealants.

3.7 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing

and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 07 62 00

SECTION 07 72 53 - SNOW GUARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rail-type, seam-mounted snow guards.

1.2 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

1. Rail-type, seam-mounted snow guards.

B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.

1. Include details of rail-type snow guards.

C. Samples:

1. Rail-Type Snow Guards: Bracket, **12-inch-** long rail, and installation hardware.

1.3 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit adhesive-mounted snow guards to be installed, and adhesive cured, according to adhesive manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally induced movement without failure, rattling, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Structural Performance: Snow guards to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Snow Loads: As indicated on Drawings.

2.2 RAIL-TYPE SNOW GUARDS

A. Rail-Type, Seam-Mounted Snow Guards:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Alpine SnowGuards or comparable product by one of the following:

a. Berger; division of OmniMax International, Inc.
b. Sno Gem

2. Description: Snow guard rails fabricated from metal pipes, bars, or extrusions, anchored to brackets and equipped with two rails.
3. Brackets and Baseplate: ASTM B209 aluminum; clear anodized.
4. Bars: ASTM B221 aluminum, clear anodized.

a. Profile: Square.

5. Seam Clamps: **ASTM B221** aluminum extrusion or ASTM B85/B85M aluminum casting with stainless steel set screws incorporating round nonpenetrating point; designed for use with applicable roofing system to which clamp is attached.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare substrates for bonding snow guards.

B. Prime substrates according to snow guard manufacturer's written instructions.

3.3 INSTALLATION

A. Install snow guards according to manufacturer's written instructions.

B. Attachment for Standing-Seam Metal Roofing:

1. Do not use fasteners that will penetrate metal roofing or fastening methods that void metal roofing finish warranty.
2. Rail-Type, Seam-Mounted Snow Guards:

    a. Install brackets to vertical ribs in straight rows.
    b. Secure with stainless steel set screws, incorporating round nonpenetrating point, on same side of standing seam.
    c. Torque set screw in accordance with manufacturer's written instructions.
    d. Install cross members to brackets.

END OF SECTION 07 72 53

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Penetration firestopping systems.

1. Penetration firestopping systems in fire-resistance-rated walls.
2. Penetration firestopping systems in horizontal assemblies.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for non-fire-resistance-rated joint sealants.
2. Section 079219 "Acoustical Joint Sealants" for sealing joints in sound-rated construction.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping systems when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping system materials in accordance with manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.6 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be accessed and installed in accordance with specified firestopping system design.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain penetration firestopping systems for each type of opening indicated from single manufacturer.

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. 3M Building and Construction
2. Hilti, Inc.
3. Tremco Incorporated

B. Penetration firestopping systems must be compatible with one another, with the substrates forming openings, and with penetrating items if any.

1. Penetration firestopping systems must be installed with products bearing the classification marking of a qualified testing agency.

a. UL Solutions in its online directory "Product iQ."
b. Intertek Group in its "Directory of Building Products."
c. FM Approvals in its "Approval Guide."

2. Provide components for each penetration firestopping system that, upon curing, do not re-emulsify, dissolve, leach, break down, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water, or other forms of moisture characteristic during and after construction.
3. Provide components for each penetration firestopping system that do not contain ethylene glycol.
4. Provide components for each penetration firestopping system that are sufficiently flexible to accommodate movement, such as pipe vibration, water hammer,

thermal expansion, and other normal building movement without damage.

5. Provide components for each penetration firestopping system that are appropriately tested for the thickness and type of insulation utilized.

C. Provide penetration firestopping systems that resist spread of fire, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

D. Penetration Firestopping Systems in Fire-Resistance-Rated Walls: Systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: Not less than the fire-resistance rating of the wall assembly penetrated.
2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.

E. Penetration Firestopping Systems in Horizontal Assemblies: Systems with ratings determined in accordance with ASTM E814 or UL 1479.

1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor/ceiling assembly penetrated.
2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor/ceiling assembly. The following horizontal penetrations do not require a T-rating:

    a. Those within the cavity of a wall.
    b. Floor, tub, or shower drains within a concealed space.
    c. **4-inch** or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.

F. Penetration Firestopping Systems in Smoke Barriers: Systems with ratings determined in accordance with UL 1479.

G. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested in accordance with ASTM E84 or UL 723.

2.3 ACCESSORIES

A. Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated, including but not limited to:

1. Permanent forming/damming/backing materials.
2. Substrate primers.
3. Collars.
4. Steel sleeves.

2.4 FILL MATERIALS

A. Cast-in-Place Firestopping Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestopping Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, and when required by a listed system, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed or dislodged.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

K. Thermal and Endothermic Wraps: Flexible, insulating, and fire-resistant protective wraps tested and listed for up to 2-hour fire ratings in accordance with ASTM E814 or UL 1479; for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines, and for thermal barrier and circuit integrity protection in accordance with ASTM E1725 or UL 1724.

L. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls which accept standard accessories.

M. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.

1. Fire-rated cable pathway devices are the preferred product for data, video, and communications cable penetrations. Install these devices in locations where frequent cable moves, add-ons, and changes will occur. Such devices must be:

   a. Capable of retrofit around existing cables.
   b. Designed so that two or more devices can be ganged together.
   c. Maintenance-free so no action is required to activate the smoke- and fire-sealing mechanism.

2. Where fire-rated cable pathway devices are not practical, openings within walls and floors designed to accommodate data, video, and communications cabling must be provided with re-enterable products specifically designed for retrofit, such as retrofit devices for cable bundles, firestopping putty, plugs, or pillows.

N. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.

O. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestopping gasket for use around rectangular steel HVAC ducts without fire dampers.

P. Firestopping Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.

Q. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to **1/2 inch** in diameter.

2.5 MIXING

A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings in accordance with manufacturer's written instructions and with the following requirements:

1. Remove foreign materials from substrate surfaces that could interfere with adhesion of penetration firestopping materials.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Prime substrates in accordance with penetration firestopping system manufacturer's written installation instructions, using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS

A. General: Install penetration firestopping systems in accordance with manufacturer's written installation instructions and published drawings for products and applications.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

C. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than **3 inches** high and with minimum **0.375-inch** strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at **15 ft.** from end of wall and at intervals not exceeding **30 ft.**.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified inspection agency to conduct and report on inspections in accordance with ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonstaining silicone joint sealants.
2. Urethane joint sealants.
3. Butyl joint sealants.
4. Latex joint sealants.

B. Related Requirements:

1. Section 079100 "Preformed Joint Seals" for preformed compressible foam and precured joint seals.
2. Section 079219 "Acoustical Joint Sealants" for sealing joints in sound-rated construction.
3. Section 321373 "Concrete Paving Joint Sealants" for sealing joints in paved roads, parking lots, walkways, and curbing.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Nonstaining silicone joint sealants.
2. Urethane joint sealants.
3. Butyl joint sealants.
4. Latex joint sealants.

B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in **1/2-inch-** wide joints formed between two **6-inch-** long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Manufacturers' special warranties.

B. Installer's special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified in accordance with ASTM C1021 to conduct the testing indicated.

1.6 MOCKUPS

A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.

B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Dowsil 795 by Dow Chemical Company or comparable product by one of the following:

a. GE Construction Sealants; Momentive Performance Materials Inc.
b. Tremco Incorporated
c. Sonneborn

2.4 URETHANE JOINT SEALANTS

A. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation
b. Polymeric Systems, Inc.; PPG Industries, Inc.
c. Sherwin-Williams Company (The)

B. Urethane, M, NS, 25, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 25, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Sherwin-Williams Company (The)

C. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 50, Uses T and NT.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. LymTal International, Inc.

D. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 25, Uses T and NT.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. LymTal International, Inc.
b. Pecora Corporation
c. Sherwin-Williams Company (The)
d. Tremco Incorporated

2.5 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

2.6 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Tremco Butyl Sealant or comparable product by one of the following:

a. Sonneborn
b. W.R. Grace
c. or approved equal

2.7 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

1. Basis-of-Design Product: Subject to compliance with requirements, provide AC-20+ by Pecora or comparable product by one of the following:

a. PPG Paints; PPG Industries, Inc.
b. Sherwin-Williams Company (The)
c. Tremco Incorporated

2.8 JOINT-SEALANT BACKING

A. Sealant Backing Material: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sonofoam by Sonneborn or comparable product by one of the following:

a. Construction Foam Products; a division of Nomaco, Inc.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of

sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.
    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

3.4 MANUFACTURER'S RECOMMENDATIONS

A. Manufacturer's recommendations for installation of these materials shall be followed not-with-standing these specifications.

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

a. Extent of Testing: Test completed and cured sealant joints as follows:

1) Perform one test for each 1000 ft. of joint length thereafter or one test per each floor per elevation.

b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

c. Inspect tested joints and report on the following:

1) Whether sealants filled joint cavities and are free of voids.
2) Whether sealant dimensions and configurations comply with specified requirements.
3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

B. Prepare test and inspection reports.

3.6 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 07 92 19 - ACOUSTICAL JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Acoustical joint sealants.

B. Related Requirements:

1. Section 079200 "Joint Sealants" for elastomeric, latex, and butyl-rubber-based joint sealants for nonacoustical applications.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants, showing full range of available colors for each product exposed to view.

C. Samples for Verification: For each type and color of acoustical joint sealant required.

1. Size: **1/2-inch-** wide sealant joints formed between two **6-inch-** long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Acoustical Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:

1. Product Test Reports: For each type of acoustical joint sealant, for tests performed by qualified testing agency.

B. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Warranty Documentation:

1. Manufacturers' special warranties.

2. Installer's special warranties.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained between **40 and 95 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 60 and 90 deg F.

1.7 WARRANTY

A. Installer's Special Warranty: Installer agrees to repair or replace acoustical joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Manufacturer's Special Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACOUSTICAL JOINT SEALANTS

A. Acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies in accordance with ASTM E90.

B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C834.

1. Basis-of-Design Product: Subject to compliance with requirements, provide SpecSeal Smoke ‘N’ Sound Sealant by Specified Technologies or comparable product by one of the following:

a. DAP Products Inc.
b. Hilti, Inc.
c. Pecora Corporation

d. Specified Technologies Inc.
e. or approved equal

2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.

2.2 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by acoustical joint-sealant manufacturer where required for adhesion of sealant to joint substrates.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where recommended by acoustical joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

A. Comply with acoustical joint-sealant manufacturer's written installation instructions

unless more stringent requirements apply.

B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C919, ASTM C1193, and manufacturer's written instructions for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of acoustical joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect acoustical joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 19

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.

B. Related Requirements:

1. Section 081119 "Stainless-Steel Doors and Frames" for hollow-metal doors and frames manufactured from stainless steel.
2. Section 083473.13 "Metal Sound Control Door Assemblies" for packaged, acoustically rated hollow-metal door and frame assemblies.
3. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.

B. Product Data Submittals: For each product.

1. Include construction details, material descriptions, core descriptions, and finishes.

C. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
7. Details of anchorages, joints, field splices, and connections.
8. Details of accessories.
9. Details of moldings, removable stops, and glazing.

D. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.

E. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency indicating compliance with performance requirements.

B. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.

C. Field quality-control reports.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum **4-inch-** high wood blocking. Provide minimum **1/4-inch** space

between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ceco Door; AADG, Inc.; ASSA ABLOY
2. Curries, AADG, Inc.; ASSA ABLOY Group
3. Steelcraft; Allegion plc
4. Titan Metal Products
5. Trudoor, LLC

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.77 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C1363 or ASTM E1423.

2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule on Drawings.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule on Drawings.
b. Thickness: **1-3/4 inches**.
c. Face: Uncoated steel sheet, minimum thickness of **0.042 inch**.
d. Edge Construction: Model 1, Full Flush.
e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
f. Core: Manufacturer's standard Kraft-paper honeycomb Polystyrene Polyurethane Polyisocyanurate Vertical steel stiffener at manufacturer's

discretion.

g. Fire-Rated Core: Manufacturer's standard laminated mineral board core for fire-rated doors.

2. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of **0.053 inch**.
b. Construction: Slip-on drywall Full profile welded.

3. Exposed Finish: Prime.

2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule on Drawings.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule on Drawings.
b. Thickness: **1-3/4 inches**.
c. Face: Metallic-coated steel sheet, minimum thickness of **0.042 inch**, with minimum A40 coating.
d. Edge Construction: Model 1, Full Flush.
e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
g. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
h. Core: Manufacturer's standard Polystyrene Polyurethane Polyisocyanurate Vertical steel stiffener at manufacturer's discretion.

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of **0.053 inch**, with minimum A40 coating.
b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame

standard, and suitable for performance level indicated.

a. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
b. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
c. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each **24 inches** of frame height above **7 feet**.
3. Postinstalled Expansion Anchor: Minimum **3/8-inch-** diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor. Form from same material as frames, minimum thickness of 0.042 inch

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than **2-inch** height adjustment. Terminate bottom of frames at top of underlayment.

D. Floor Anchors for Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

E. Material: ASTM A879/A879M, Commercial Steel (CS), **04Z** coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.6 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for

application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

H. Glazing: Comply with requirements in Section 088000 "Glazing."

I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection ratings indicated.
3. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

C. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum **3/4 inch** beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

D. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide

alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

        1) Two anchors per jamb up to 60 inches (1524 mm) high.
        2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
        4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.

    b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

        1) Three anchors per jamb up to 60 inches (1524 mm) high.
        2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
        3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
        4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

    c. Compression Type: Not less than two anchors in each frame.
    d. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

E. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

F. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

G. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Provide stops and moldings flush with face of door, and with beveled stops unless otherwise indicated.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than **9 inches** o.c. and not more than **2 inches** o.c. from each corner.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.9 Accessories

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11 orNAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

    a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
    b. Install frames with removable stops located on secure side of opening.
    c. Install door silencers in frames before grouting.
    d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    f. Field apply bituminous coating to backs of frames that will be filled with

grout containing antifreezing agents.

2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
8. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus **1/16 inch**, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus **1/16 inch**, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus **1/16 inch**, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus **1/16 inch**, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors

    a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch (0.8 mm).
    d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:

1. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.

3.5 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish in accordance with manufacturer's written instructions.

C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

3.6 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

END OF SECTION 08 11 13

SECTION 08 22 20 - FIBERGLASS REINFORCED PLASTIC (FRP) DOORS AND FRAMES

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting

B. Within 30 days of Contract Award, the Owner will schedule a Pre-Installation meeting. For that meeting, submit the following for review and approval:

1. Shop Drawings

    a. Doors
    b. Frames
    c. Door Hardware Components and Accessories
    d. Weather-stripping
    e. Smoke Seals

2. Include fabrication, installation details, schedule and location for doors, frames, hardware components and accessories, showing plans, elevations, sections, details, method of glazing within the door, construction and installation attachments to other work.
3. Submit manufacturer's catalog data, including material descriptions for doors, frames, and accessories, dimensions of individual components and profiles, and finishes for each type of door, frame, hardware components and accessories of size, design, and location indicated.
4. Submit documentation substantiating that the items provided within this section are from a manufacturer having a minimum of 10 year’s experience in the design and manufacture of similar products and systems.

    a. Submit Sample Warranty.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Deliver FRP doors, frames, components and accessories in manufacturer's original unopened packaging. Mark and remove damaged materials from the project site. Where materials are covered by a referenced specification, label the package with the specification number, type, and class, as applicable. Deliver materials in sufficient quantity to allow work to proceed without interruption.

B. Storage

1. Protect materials against moisture absorption and contamination or other damage.
2. Store all materials on clean raised platforms or pallets one level high in dry

locations with adequate ventilation, such as an enclosed building or closed trailer.

3. Do not store materials in buildings under construction until concrete, mortar, and plaster work is finished and dry.
4. Do not store materials outdoors unless approved by the Owner. Completely cover materials stored outdoors, with waterproof canvas protective covering. Tie covering securely to pallets to ensure complete weatherproofing is met. Provide sufficient ventilation to prevent condensation. Do not use polyethylene sheet as a covering.
5. Do not store materials in contact with other materials that might cause staining, denting, or other surface damage.

C. Handling

1. Prevent damage to corners, edges and ends of materials. Do not install damaged materials in the work.Select and operate material handling equipment to prevent damage to materials.

1.3 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Take Field measurements prior to the preparation of drawings and fabrication.

1.4 WARRANTY

A. Submit sample material and workmanship warranties meeting specified requirements. Provide revision or amendment to standard manufacturer warranty as required to comply with the specified requirements.

B. Furnish the manufacturer's 5 year no dollar limit for materials and installation, workmanship, and deterioration of factory-applied finishes within specified warranty period. Provide warranty directly to the Owner and commence warranty effective date at time of Owner's acceptance of the work.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Special-Lite
2. FRP Architectural Doors Inc.
3. Ceco Door; AADG, Inc.; ASSA ABLOY
4. Curries, AADG, Inc.; ASSA ABLOY Group
5. Trudoor, LLC

B. Source Limitations: Obtain work from single source from single manufacturer.

C. Provide door and frame components including, but not limited to, astragals, cores, faces, stiles, rails, heads, jambs, and internal reinforcement, which are FRP structural shapes manufactured by the pultrusion process. Ensure all structural shapes are composed of fiberglass reinforcement and resin in qualities, quantities, properties, arrangements and dimensions as necessary to meet the design requirements in accordance with ASCE 7, ICC IBC and dimensions specified.

D. Ensure fiberglass reinforcements are a combination of continuous roving, continuous strand mat, and surfacing veil in sufficient quantities as needed by the application and/or physical properties required.

E. Verify resins are of isophthalic polyester with chemical formulation necessary for corrosion resistance, strength and other physical properties as required.

F. Design Requirements

1. Finish Surfaces

a. Ensure all finished surfaces of FRP items and fabrications are smooth, resin-rich, free of voids and without dry spots, cracks, and un-reinforced areas. Completely cover all glass fibers with resin to protect against their exposure due to wear or weathering. Factory finish surfaces per colors specified on drawings.

2. Ultraviolet Protection

a. Provide documentation that all pultruded structural shapes are further protected from ultraviolet (UV) attack with

1) Integral UV inhibitors within the resin
2) Synthetic surfacing veil to help produce a resin rich surface
3) UV resistant coating for outdoor exposures.

3. Flame Spread Rating

a. All FRP products to have a flame spread rating of 25 or less as per ASTM E84Tunnel Test.

4. Structural Properties

a. Meet minimum longitudinal structural properties with structural shapes in the door and frame system as follows

1) Tensile Strength

a) ASTM D638 - 30,000 psi

2) Compressive Strength

a) ASTM D695 - 30,000 psi

3) Flexural Strength

a) ASTM D790 - 30,000 psi

4) Flexural Modulus

a) ASTM D790 - 1,600,000 psi

5) Short Beam Shear

a) ASTM D2344/D2344M - 4,500 psi

6) Impact, Notched

a) ASTM D256 - 25 ft-lb/in

7) Thermal Expansion

a) ASTM D696 - .000008 in/in/F

8) Fire Resistance

a) ASTM E84 - Class I

5. FRP Door and Frame

a. Provide complete swing-type FRP doors with frames of the size, design and location indicated, including but not limited to, framing members, subframes, and accessories.

1) FRP Door

a) Provide and install a seamless press-molded constructed FRP door. Laminate FRP face sheets to be applied while wet and uncured to an internal door stile and rail subframe/core assembly which is pressure molded under heat. Integrally fuse the composite door panel over the entire surface area, do not adhesive bond at the perimeter stile and rail.

b) Provide door stiles and rails which are high-modulus pultruded FRP square or rectangular tube subframe. Miter and join tubes internally at the corners with solid polymer blocks to yield a one piece unit. Provide a mid-rail tube across the width of the door at lockset height and additional horizontal rails where specified. Chemically weld all connections. No mechanical fastening at the tube joints is permitted.

c) Provide a triangular shaped 3/8-inch phenolic resin impregnated kraft paper honeycomb cell core for maximum rigidity and compressive strength. Use of polyurethane foam or balsa wood cores are not permitted. Provide door stiles and rails which are high-modulus pultruded FRP square or rectangular tube subframe. Miter and join tubes internally at the

corners with solid polymer blocks to yield a one piece unit. Provide a mid-rail tube across the width of the door at lockset height and additional horizontal rails where specified. Chemically weld all connections. No mechanical fastening at the tube joints is permitted.

d) Provide internal reinforcement composed of high-modulus pultruded tubular FRP or high-density polymer compression blocks at all hardware and corner locations. No aluminum, steel, or wood blocking for reinforcement is permitted. A minimum pull-out force strength of 900 pounds per screw is required for all hinge locations.

e) Door faces are to utilize a chemical resistant thermosetting polyester resin with fiberglass reinforcing layers. Provide structural reinforcement which is knitted multi-layer material with layers of unidirectional fiberglass orientated in both vertical and horizontal directions for high stiffness, impact and warp resistance. Furnish door faces as indicated by the door elevation drawings.

f) Ensure the exposed finish of the FRP door faces are to be a ultra-violet light stabilized marine grade Neopentyl Glychol (NPG)-isophthalic polyester gelcoat integrally molded to a 25/30 mil wet thickness.

g) Provide an integral heavy pultruded FRP astragal on the stile edge of the inactive leaf for double doors of the same materials as specified for door stiles and rails.

h) Cutouts for door lights and louvers are to be manufactured and not field fabricated. Cutouts are to be totally enclosed by internal pultruded FRP stiles and rails as specified and incorporated into the door subframe with the opening completely fused to both door faces.

i) Provide raised panel door as indicated by the door elevation drawings and schedule. Plants to be applied by the manufacturer as an integral part of the door face and not field applied. All molding and plants are to be a rein material and installed by the manufacturer to resemble a raised panel door.

2) FRP Frame

a) Provide FRP Door Frame utilizing a high-modulus pultruded structural FRP shape. Fabricate pultruded frame with a wall thickness of not less than 3/16-inch. Frames are to be one-piece factory constructed with molded stop. Jambs and header to utilize miter corner connections chemically welded with FRP material ground for a visibly smooth frame face. Post and beam or mechanical fastened corners and joints are not acceptable. Provide sizes and shapes as detailed on the approved drawings.

b) Provide hardware reinforcement connections utilizing a chemical weld with FRP material at required locations. A minimum pull-out force strength of 1,100 lbs per screw is required for all hardware locations.

c) Frame finish is to be identical to door color and finish.

6. Frame Anchors

a. Provide anchorage devices and fasteners where necessary for fastening fabricated FRP door frame to the adjacent construction-in-place as recommended by the FRP frame manufacturer.

7. Jamb Anchors

a. Provide anchors of the material, type, number, and spacing as required by the FRP frame manufacturer.

8. Hardware Preparation

a. Provide hardware reinforcing as specified. Prepare doors and frames for hardware in accordance with the applicable requirements of the FRP door and frame manufacturer. For additional requirements refer to ANSI/BHMA A156.115.

G. Performance Requirements

1. Air Infiltration

a. When tested in accordance with ASTM E283, air infiltration is not to exceed 0.06 cubic feet per minute per square foot of fixed area at a test pressure of 6.24 pounds per square foot 50 mile per hour wind.

2. Water Penetration

a. When tested in accordance with ASTM E331, no water penetration is allowed, at a pressure of 8 pounds per square foot of fixed area.

3. Provisions for Thermal Movement

a. Design doors and frames to provide for expansion and contraction of the component parts caused by an ambient temperature range of 0 to 100 degrees F causing buckling, opening of joints, overstressing of fasteners, or other harmful effects.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Conform all work to the requirements of 29 CFR 1910, 29 CFR 1926, and NFPA 241.

B. FRP Frame

1. Set FRP door frame plumb and true, aligned, and secured with the adjacent construction-in-place, in conformance with ASTM E2112. Anchor frame as

specified and in accordance with the FRP door manufacturer's requirements.

2. Installation Tolerances

    a. Sureness: Plus or minus 1/16-inch, measure at the door rabbet on a line 90 degrees from the jamb perpendicular to the frame head.
    b. Alignment: Plus or minus 1/16-inch, measure at the jamb on a horizontal line parallel to the wall plane.
    c. Twist: Plus or minus 1/16-inch, measure at the opposite face corners of the jambs on parallel lines, and perpendicular to the wall plane.
    d. Plumb and True: Plus or minus 1/16-inch, measure at the jambs to the floor.

C. FRP Door

1. Fit and hang door in accordance with clearances specified below:
2. Clearance Tolerances

    a. Jambs and Head: Plus 1/8-inch or minus 1/16-inch.
    b. Pairs of Doors: Plus 1/8 inch or minus 1/16-inch.
    c. Bottom of Door and Top of Threshold: Maximum 3/8-inch.
    d. Bottom of Door and Top of finish floor (No Threshold: Maximum 3/4-inch.

3.2 ADJUSTING AND CLEANING

A. Check and re-adjust all operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including all FRP that is warped, bowed, or otherwise unacceptable to the Owner.

3.3 PROTECTION

A. Protect doors and frames from damage. Repair damaged doors and frames prior to final completion and acceptance of the project or replace with new, as directed by the Owner. Thoroughly clean all surfaces of the door and frame prior to final completion and acceptance of the project.

3.4 CLOSEOUT ACTIVITIES

A. Warranty

1. Submit approved Warranty made out to the Owner, to the Owner no later than 10 days prior to final inspection,

END OF SECTION 08 22 20

SECTION 08 36 13 - SECTIONAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sectional-door assemblies.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
2. Section 087100 "Door Hardware" for lock cylinders and keying.
3. Section 099113 "Exterior Painting" for finish painting of factory-primed steel frames.
4. Division 26 Sections for electrical service and connections for powered operators and accessories

1.2 DEFINITIONS

A. Operational Cycle: One cycle of a door is complete when it is moved from the closed position to the fully open position and returned to the closed position.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
2. For power-operated doors, include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.

D. Samples for Initial Selection: For units with factory-applied finishes.

1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of exposed finish and for each color and texture required on the following components, in manufacturer's standard sizes:

1. Glazing.
2. Metal for door sections.

a. 6 inches square

F. Delegated-Design Submittal: For sectional doors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Summary of forces and loads on walls and jambs.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For manufacturer's warranty and finish warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sectional doors to include in maintenance manuals.

B. Manufacturer's warranty.

C. Finish warranty.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

B. Source Limitations: Obtain sectional doors from single source from single manufacturer.

1. Obtain operators and controls from sectional door manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Standard for Sectional Doors: Fabricate sectional doors to comply with DASMA 102 unless otherwise indicated.

E. Regulatory Requirements: Comply with provisions in the U.S. Department of Justice's "2010 ADA Standards for Accessible Design" the United States Access Board's "Architectural Barriers Act (ABA) Standards" applicable to sectional doors.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Failure of components or operators before reaching required number of operation cycles.
c. Faulty operation of hardware.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
e. Delamination of exterior or interior facing materials.

2. Warranty Period: Five years from date of Substantial Completion.

B. Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain sectional doors from single source from single manufacturer.

1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Provide sectional doors that comply with performance requirements specified without failure from defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.

B. Delegated Design: Design sectional doors, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

C. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.
2. Testing: In accordance with ASTM E330/E330M or DASMA 108 for garage doors and complying with DASMA 108 acceptance criteria.
3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

    a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of door width.
    b. Deflection of horizontal track assembly shall not exceed 1/240 of door height.

D. Windborne-Debris Impact Resistance: Provide sectional doors complying with the following requirements:

1. Glazed Openings: Pass ASTM E1886 Large Missile Test and cyclic-pressure tests in accordance with ASTM E1996 for basic protection and Wind Zone applicable to basic design wind speed indicated on Drawings.
2. Garage-Door Glazed Openings: Pass DASMA 115.

2.3 SECTIONAL-DOOR ASSEMBLY

A. Sectional Door: Providesteel sectional door formed with hinged sections and fabricated so that finished door assembly is rigid and aligned with tight hairline joints; free of warp, twist, and deformation; and complies with requirements in DASMA 102.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Thermospan 200-20 by Wayne Dalton; a division of Overhead Door Corporation or comparable product by one of the following:

    a. Clopay Building Products
    b. Haas Door; a Nofziger Company
    c. Overhead Door Corporation

B. Operation Cycles: Door components and operators capable of operating for not less than 10,000 operation cycles. One operation cycle is complete when door is opened from closed position to the open position and returned to closed position.

C. Air Infiltration: Maximum rate of 0.4 cfm/sq. ft. when tested in accordance with ASTM E283 or DASMA 105.

D. U-Value: 0.067.

E. Steel Door Sections: ASTM A653/A653M, zinc-coated (galvanized), cold-rolled, commercial steel sheet with G60 zinc coating.

1. Door-Section Thickness: 2 inches.
2. Section Faces:

    a. Thermal-Break Construction: Provide sections with continuous thermal-

break construction separating the exterior and interior faces of door.

b. Exterior Face: Fabricated from single sheets, not more than 24 inches high; with horizontal meeting edges rolled to continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove, weather- and pinch-resistant seals and reinforcing flange return.

1) Steel Sheet Thickness: 0.064-inch nominal coated thickness.
2) Surface: Manufacturer's standard, flat.

c. Interior Face: Enclose insulation completely within steel exterior facing and interior facing material, with no exposed insulation. Provide the following interior-facing material:

1) Zinc-Coated (Galvanized) Steel Sheet: With minimum nominal coated thickness of 0.022 inch.

a) Applicable at non-Wash Bay doors.

2) Stainless Steel Sheet: 24 gage, 316L with #4 finish.

a) Applicable at Wash Bay doors.

3. End Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel (stainless steel at Wash Bay doors) sheet not less than 0.064-inch nominal coated thickness and welded to door section.
4. Intermediate Stiles: Provide intermediate stiles formed from not less than 0.064-inch- thick galvanized-steel (stainless steel at Wash Bay doors) sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches apart.
5. Section Reinforcing: Horizontal and diagonal reinforcement as required to stiffen door and for wind loading. Provide galvanized-steel (stainless steel at Wash Bay doors) bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.

a. Bottom Section: Reinforce section with a continuous channel or angle conforming to bottom-section profile and allowing installation of astragal (weatherseal).
b. Hardware Locations: Provide reinforcement for hardware attachment.

6. Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free insulation of type indicated below:

a. Board Insulation: polyurethane, secured to exterior face sheet.
b. Foamed-in-Place Insulation: Polyurethane, foamed in place to completely fill interior of section and pressure bonded to face sheets to prevent delamination under wind load.
c. Fire-Resistance Characteristics: Maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, in accordance with ASTM E84.

F. Track: Manufacturer's standard, galvanized-steel (stainless steel for Wash Bay doors), standard-lift track system. Provide complete system including brackets, bracing, and

reinforcement to ensure rigid support of ball-bearing roller guides.

1. Material:For non-wash bay doors, Galvanized steel, ASTM A653/A653M, minimum **G60** zinc coating. For Wash Bay doors, Stainless steel.
2. Size: As recommended in writing by manufacturer for door size, weight, track configuration and door clearances indicated on Drawings.
3. Track Reinforcement and Supports: Provide galvanized-steel members (stainless steel for Wash Bay doors) to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced **2 inches** apart for door-drop safety device.

    a. Vertical Track: Incline vertical track to ensure weathertight closure at jambs. Provide continuous angle attached to track and wall.
    b. Horizontal Track: Provide continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.

G. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom top and jambs of door. Provide combination bottom weatherseal and sensor edge for bottom seal.

H. Windows: Manufacturer's standard window units of shape and size and in locations indicated on Drawings. Set glazing in vinyl, rubber, or neoprene glazing channel. Provide removable stops of same material as door-section frames. Provide the following glazing:

1. Clear Float Glass: 3 mm thick and complying with ASTM C1036, Type I, Class 1, Quality-Q3.
2. Approximately 24 by 11 inches (610 by 279 mm), with square corners, and spaced apart the approximate distance as indicated on Drawings; in one row at height indicated on Drawings.

I. Hardware: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless steel, or other corrosion-resistant fasteners, to suit door type. Must be stainless steel for Wash Bay doors.

1. Hinges: Heavy-duty, galvanized-steel (or stainless steel at Wash Bay doors) hinges of not less than **0.079-inch** nominal coated thickness at each end stile and at each intermediate stile, in accordance with manufacturer's written recommendations for door size.

    a. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible.
    b. Provide double-end hinges where required for doors more than **16 ft.** wide unless otherwise recommended by door manufacturer in writing.

2. Rollers: Heavy-duty rollers with steel ball bearings in case-hardened steel races, mounted to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Match roller-tire diameter to track width.

a. Roller-Tire Material: Case-hardened steel Polyethylene for Wash Bay Doors.

3. Push/Pull Handles: Equip each door with galvanized-steel (stainless steel for Wash Bay doors) lifting handles on each side of door, finished to match door.

J. Locking Device:

1. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded deadbolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

a. Lock Cylinders: Cylinders complying with Section 087100 "Door Hardware" requirements.
b. Keying: Keyed to building keying system.
c. Keys: Three for each cylinder.

2. Chain Lock Keeper: Suitable for padlock.
3. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

K. Counterbalance Mechanism:

1. Torsion Spring: Adjustable-tension torsion springs complying with requirements of DASMA 102 for number of operation cycles indicated, mounted on torsion shaft.

a. For Wash Bay Doors, Fabricated from 302 series stainless steel wire.

2. Cable Drums and Shaft for Doors: Cast-aluminum cable drums (stainless steel casting cable drum for Wash Bay doors) mounted on torsion shaft and grooved to receive door-lifting cables as door is raised.

a. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.
b. Provide one additional midpoint bracket for shafts up to **16 ft.** long and two additional brackets at one-third points to support shafts more than **16 ft.** long unless closer spacing is recommended in writing by door manufacturer.

3. Cables: Galvanized-steel (stainless steel for Wash Bay doors), multistrand, lifting cables with cable safety factor of at least 5 to 1.
4. Cable Safety Device: Include a spring-loaded steel (stainless steel for Wash Bay doors) or bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if lifting cable breaks.
5. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

a. Bracket to be stainless steel for Wash Bay doors.

6. Bumper: Provide spring bumper at each horizontal track to cushion door at end

of opening operation.

L. Manual Door Operator:

1. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 35 lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

M. Electric Door Operator: Electric door operator assembly of size and capacity recommended by door manufacturer for door and operation cycles specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Logic 5.0 by LiftMaster comparable product by one of the following:

   a. Overhead Door Corporation

2. Comply with NFPA 70.
3. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24 V ac or dc.
4. Safety: Listed in accordance with UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 ft. or lower.
5. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
6. Operator Type: Manufacturer's standard for door requirements.
7. Motor: Reversible-type with controller (disconnect switch) for interior, clean, and dry andexterior, dusty, wet, or humid motor exposure. Use adjustable motor-mounting bases for belt-driven operators.

   a. Motor Size: As required to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
   b. Electrical Characteristics:

      1) Phase: Polyphase. Medium Induction Type
      2) Volts: 120 V.
      3) Service Factor: Comply with NEMA MG 1, unless otherwise indicated.
      4) Coordinate wiring requirements and electrical characteristics of motors with building electrical system.

         a) For Wash Bay doors, provide totally enclosed, non-ventilated or fan cooled motor fitted with plugged drain, and controller with NEMA ICS 6, Type 4 enclosure..
         b) For non-Wash Bay doors, provide open dripproof type motor, and controller with NEMA ICS 6, Type 1 enclosure.

5) Electric door operators shall have a designated point for door control wiring to be interrupted so that the control functions of both the control stations and the radio transmitters can be disabled. Furnish information to Electrical Contractor for designated point for door control wiring to be interrupted. Electrical Contractor will provide interrupting relay and on-off switch in time keeper's office.

8. Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
9. Obstruction Detection: Automatic external entrapment protection consisting of automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

    a. Monitored Entrapment Protection: Photoelectric sensor andElectric sensor edge on bottom section designed to interface with door-operator control circuit to detect damage to or disconnection of sensor and complying with requirements in UL 325.

10. Control Station: Surface mounted, three-position (open, close, and stop) control.

    a. Operation: Push button.
    b. Interior-Mounted Unit: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure for non-Wash bay doors,standard-duty, weatherproof-type, NEMA ICS 6, Type 4 enclosure for Wash Bay doors.
    c. Features: Provide the following:

        1) Vehicle detection operation.
        2) Radio-control operation.
        3) Card-reader control.
        4) Photocell operation.
        5) Door-timer operation.
        6) Explosion- and dust-ignition-proof control wiring.
        7) Audible and visual signals that comply with regulatory requirements for accessibility.

11. Emergency Manual Operation: Chain type designed so required force for door operation does not exceed 35 lbf.
12. Emergency Operation Disconnect Device: Hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
13. Motor Removal: Design operator so motor can be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

N. Metal Finish: Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.

1. Factory Prime Steel Finish: Manufacturer's standard primer,compatible with field-applied finish and in manufacturer's standard color. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
2. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; in accordance with manufacturer's written instructions.

B. Tracks:

1. Fasten vertical track assembly to opening jambs and framing with fasteners spaced not more than **24 inches** apart.
2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

D. Power-Operated Doors: Install in accordance with UL 325.

3.3 STARTUP SERVICES

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks in accordance with manufacturer's written instructions.
2. Test and adjust controls and safety devices. Replace damaged and

malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust doors and seals to provide weather-resistant fit around entire perimeter.

D. Align and adjust motors, pulleys, belts, sprockets, chains, and controls according to manufacturer's written instructions.

E. Touchup Painting Galvanized Material: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A780/A780M.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 08 36 13

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed entrance and storefront systems.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings:

1. Plans, elevations, sections, full-size details, and attachments to other work.
2. Details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
3. Full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrance and storefront systems, showing the following:

    a. Joinery, including concealed welds.
    b. Anchorage.
    c. Expansion provisions.
    d. Glazing.
    e. Flashing and drainage.

4. Connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
5. Point-to-point wiring diagrams showing the following:

    a. Power requirements for each electrically operated door hardware.
    b. Location and types of switches, signal device, conduit sizes, and number and size of wires.

6. Signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish.

1. Size: Manufacturers' standard size.

E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

F. Delegated Design Submittals: For aluminum-framed entrances and storefront systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For aluminum-framed entrance and storefront systems, for tests performed by a qualified testing agency.

B. Field Quality-Control Reports: For aluminum-framed entrance and storefront systems.

C. Qualification Statements:

1. For Installer and field testing agency.

D. Delegated Design Engineer Qualifications: For aluminum-framed entrance and storefront systems.

E. Sample Warranties: For aluminum-framed entrance and storefront systems.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For aluminum-framed entrance and storefront systems.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Authorized representative who is trained and approved by manufacturer.

B. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

C. Testing Agency Qualifications: Qualified in accordance with ASTM E699 for testing indicated and acceptable to Owner and Architect.

D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of

components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

E. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrance and storefront systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D 4214.
c. Cracking, peeling, or chipping.

2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed entrance and storefront systems.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrance and storefront systems representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrance and storefront systems to withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

    a. Thermal stresses transferring to building structure.
    b. Glass breakage.
    c. Noise or vibration created by wind and thermal and structural movements.
    d. Loosening or weakening of fasteners, attachments, and other components.
    e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of length of span of the framing member for lengths of up to 13 feet 6 inches and to 1/240 of length of span of the framing member plus 1/4 inch for lengths greater than 13 feet 6 inches.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

    a. Operable Units: Provide a minimum **1/16-inch** clearance between framing members and operable units.

E. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

G. Seismic Performance: Aluminum-framed entrance and storefront systems to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.

H. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):

a. Fixed Glazing and Framing Areas: U-factor for the system of not more than as determined in accordance with NFRC 100.
b. Entrance Doors: U-factor of not more than 0.63 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):

a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.40 as determined in accordance with NFRC 200.
b. Entrance Doors: SHGC of not more than 0.46 as determined in accordance with NFRC 200.

3. Air Leakage:

a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft. when tested in accordance with ASTM E283.
b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of **1.57 lbf/sq. ft**.

4. Condensation Resistance Factor (CRF):

a. Fixed Glazing and Framing Areas: CRF for the system of not less than 35 as determined in accordance with AAMA 1503.
b. Entrance Doors: CRF of not less than 57 as determined in accordance with AAMA 1503.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: **120 deg F**, ambient; **180 deg F**, material surfaces.
2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested in accordance with AAMA 501.5.

a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
b. Low Exterior Ambient-Air Temperature: 0 deg F.
c. Interior Ambient-Air Temperature: 75 deg F.

2.3 ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Trifab VersaGlaze 451/451T Framing System by Kawneer Company, Inc.; Arconic Corporation or comparable product by one of the following:

1. EFCO Corporation
2. OldCastle BuildingEnvelope (OBE)
3. YKK AP America Inc.

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Exterior Framing Construction: Thermally broken.
2. Interior Vestibule Framing Construction: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides.
4. Glazing Plane: Front.
5. Finish: High-performance organic finish.
6. Fabrication Method: Field-fabricated stick system.
7. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
8. Steel Reinforcement: As required by manufacturer.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.

2. Door Design: As indicated.
3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide nonremovable glazing stops on outside of door.

4. Finish: Match adjacent storefront framing finish.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

B. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance

Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:

1. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

D. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

2.6 MATERIALS

A. Sheet and Plate: **ASTM B209**.

B. Extruded Bars, Rods, Profiles, and Tubes: **ASTM B221**.

C. Extruded Structural Pipe and Tubes: ASTM B 429.

D. Structural Profiles: ASTM B308/B308M.

E. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

F. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

G. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

C. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for **30-mil** thickness per coat.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At interior and exterior doors, provide compression weather stripping at fixed stops.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At exterior doors, provide weather sweeps applied to door bottoms.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware

before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.9 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2604 and containing not less than 50 percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: Match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

I. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

J. Install joint filler behind sealant as recommended by sealant manufacturer.

K. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

L. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

M. Install glazing as specified in Section 088000 "Glazing."

3.3 ERECTION TOLERANCES

A. Install aluminum-framed entrance and storefront systems to comply with the following maximum tolerances:

1. Plumb: **1/8 inch in 10 feet**; **1/4 inch in 40 feet**.
2. Level: **1/8 inch in 20 feet**; **1/4 inch in 40 feet**.
3. Alignment:

a. Where surfaces abut in line or are separated by reveal or protruding element up to **1/2 inch** wide, limit offset from true alignment to **1/16 inch**.
b. Where surfaces are separated by reveal or protruding element from **1/2 to 1 inch** wide, limit offset from true alignment to **1/8 inch**.
c. Where surfaces are separated by reveal or protruding element of **1 inch** wide or more, limit offset from true alignment to **1/4 inch**.

4. Location: Limit variation from plane to **1/8 inch in 12 feet**; **1/2 inch** over total length.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests.

B. Tests: Perform the following tests on representative areas of aluminum-framed entrance and storefront systems.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect to be tested in accordance with AAMA 501.2 and to not evidence water penetration.

a. Perform a minimum of two tests in areas as directed by Architect.

C. Aluminum-framed entrance and storefront systems will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.5 MAINTENANCE SERVICE

A. Entrance Door Hardware Maintenance:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

END OF SECTION 08 41 13

SECTION 08 51 13 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum windows.

1.2 COORDINATION

A. Finish Matching: Coordinate all exposed exterior aluminum components and trim to ensure uniform and consistent color and appearance. Use products specified in this Section as a benchmark. Architect's decision will be final as to whether a proposed product matches.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review and discuss finishing of aluminum windows that is required to be coordinated with finishing of other aluminum work for color and finish matching.
3. Review, discuss, and coordinate interrelationship of aluminum windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
4. Review and discuss sequence of work required to construct a watertight and weathertight exterior building envelope.
5. Inspect and discuss condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes.

B. Shop Drawings:

1. Plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant

installation.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish:

1. Exposed Aluminum Finishes: 2 by 4 inches.
2. Exposed Hardware: Full-size units.

E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:

1. Product Test Reports: For each aluminum window, for tests performed by qualified testing agency.

B. Field Quality-Control Reports: For aluminum windows.

C. Qualification Statements: For manufacturer and Installer.

D. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Warranty Documentation:

1. Manufacturers' special warranties.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.

B. Installer Qualifications: Authorized representative who is trained and approved by aluminum window manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum windows to Project site in original, unopened packages and store them in accordance with manufacturer's written instructions. Protect aluminum windows against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle aluminum windows in a manner that prevents damage before, during, and after installation.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install aluminum windows outside of limits recommended in writing by manufacturer.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to meet performance requirements.
b. Structural failures, including excessive deflection, water leakage, condensation, and air infiltration.
c. Faulty operation of movable sash and hardware.
d. Deterioration of materials and finishes beyond normal weathering.
e. Failure of insulating glass.

2. Warranty Period:

a. Window: 20 years from date of Substantial Completion.
b. Glazing Units: 20 years from date of Substantial Completion.
c. Aluminum Finish: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain aluminum windows from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification:AMMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: AW.
2. Minimum Performance Grade: 40.

C. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor): As determined in accordance with NFRC 100:

a. Fixed Windows: Not more than 0.36 Btu/sq. ft. x h x deg F.
b. Operable Windows: Not more than 0.45 Btu/sq. ft. x h x deg F.

2. Solar Heat-Gain Coefficient (SHGC): As determined in accordance with NFRC 200:

a. Fixed Windows: Not more than 0.36.
b. Operable Windows: Not more than 0.33 as determined in accordance with NFRC 200.

3. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance in accordance with AAMA 1503, showing a CRF of 45.

D. Thermal Movements: Provide aluminum windows, including anchorage, which allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

E. Sound Transmission Class (STC): Rated for not less than 26 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413

F. Outdoor-Indoor Transmission Class (OITC): Rated for not less than 22 OITC when tested for laboratory sound transmission loss in accordance with ASTM E90 and determined by ASTM E1332.

2.3 ALUMINUM WINDOWS

A. Basis-of-Design Product: Subject to compliance with requirements, provide OptiQ AA 5450 Series Windows by Kawneer Company, Inc.; Arconic Corporation or comparable product by one of the following:

1. EFCO Corporation
2. Graham Architectural Products Corporation
3. OldCastle BuildingEnvelope (OBE)
4. YKK AP America Inc.

B. Provide manufacturer's standard aluminum window assemblies consisting of frames, sashes, glass, hardware, fasteners, and all components and accessories as required for a complete installation.

C. Operating Types: Provide the following operating types in locations indicated on Drawings:

1. Horizontal sliding.

D. Frames and Sashes: Aluminum extrusions of alloy, temper, and strength complying with AAMA/WDMA/CSA 101/I.S.2/A440.

1. Thermally Broken Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

E. Glass: Clear annealed glass, ASTM C1036, Type 1, Class 1, q3.

1. Kind: Fully tempered .

F. Insulating-Glass Units: ASTM E2190.

1. Glass: ASTM C1036, Type 1, Class 1, q3.

a. Tint: Clear.
b. Kind: Fully tempered .

2. Lites: Two.
3. Filling: Fill space between glass lites with argon.
4. Low-E Coating: Pyrolytic on second surface.

G. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

H. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

I. Horizontal-Sliding Window Hardware:

1. Sill Cap/Track: Manufacturer's standard of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
3. Roller Assemblies: Low-friction design.

J. Weather Stripping: Provide manufacturer's standard full-perimeter weather stripping for each operable sash unless otherwise indicated.

K. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Avoid exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 ACCESSORIES

A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

D. Panning Trim: Profiles in sizes and configurations indicated on Drawings.

E. Nail Fins: Manufacturer's standard mounting flanges with holes pre-punched for mechanical fasteners.

F. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

2.5 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

B. Glaze aluminum windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.6 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA AMP 500 "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Organic Coatings:

1. High-Performance Fluoropolymer Finish: Two coats complying with AAMA 2604, containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Color and Gloss: Match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders,air and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Install windows and components to drain water passing joints and condensation to the exterior.

D. Separate aluminum from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

B. Testing Services: Testing and inspection of installed windows as follows:

1. Testing Methodology: Testing of windows for air infiltration and water resistance in accordance with AAMA 502.
2. Air-Infiltration Testing:

a. Test Pressure: As required to determine compliance in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 for performance class indicated.
b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.

3. Water-Resistance Testing:

a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
b. Allowable Water Infiltration: No water penetration.

4. Testing Extent: Three window(s) of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows will be tested after perimeter sealants have cured.
5. Test Reports: Prepared in accordance with AAMA 502.

C. Tests and Inspections:

1. Windows will be considered defective if they do not pass tests and inspections.
2. Remove and replace noncomplying windows and retest as specified above.
3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

3.5 CLEANING AND PROTECTION

A. Clean exposed surfaces immediately after installing windows using manufacturer's written instructions. Avoid damaging finishes. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately in accordance with manufacturer's written instructions.

END OF SECTION 08 51 13

SECTION 08 56 53 - SECURITY WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fixed, transaction security windows.

1.2 COORDINATION

A. Coordinate installation of anchorages for security windows. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in adjacent construction.

1.3 PREINSTALLATION MEETINGS

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, weights and finishes for window units.

B. Shop Drawings: For security windows.

1. Include plans, elevations, sections, and attachment details.
2. Full-size section details of framing members, including internal armoring, reinforcement, and stiffeners.
3. Location of weep holes.
4. Hardware for sliding window units.
5. Glazing details.
6. Details of deal tray transaction counter and speaking aperture.

C. Samples for Initial Selection: For frame members with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:

1. Framing: **12-inch-** long sections of frame members.

E. Cutaway Sample: Corner of security window, made from **12-inch** lengths of full-size components, and showing details of the following:

1. Joinery.
2. Anchorage.

3. Glazing.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product Test Reports: For each type of security window and accessory indicated as ballistics or forced-entry resistant, for tests performed by a qualified testing agency.

C. Configuration Disclosure Drawing: For each type of forced-entry-resistant security window, complying with ASTM F1233.

D. Examination reports documenting inspections of substrates, areas, and conditions.

E. Anchor inspection reports documenting inspections of built-in and cast-in anchors.

F. Field quality-control reports documenting inspections of installed products.

1. Field quality-control certification signed by Contractor.

G. Sample Warranty: For special warranty.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
4. AWS D1.6, "Structural Welding Code - Stainless Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Pack security windows in wood crates for shipment. Crate glazing separate from frames unless factory glazed.

B. Label security window packaging with drawing designation.

C. Store crated security windows on raised blocks to prevent moisture damage.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace security windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including deflections exceeding **1/4 inch**.
b. Failure of welds.
c. Excessive air leakage.
d. Faulty operation of sliding window hardware.
e. Faulty operation of transaction drawers.
f. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Attack Resistance: Provide units identical to those tested for compliance with requirements indicated, and as follows:

1. Ballistics Resistance, UL 752: Level 2 in accordance with UL 752.
2. Forced-Entry Resistance, ASTM F1233: Class 2.0 in accordance with ASTM F1233.

B. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone 3 for basic protection.

1. Large-Missile Test: For glazing located within 30 feet of grade.
2. Small-Missile Test: For glazing located more than**30 feet** above grade.

C. Framing: Fabricate perimeter framing, mullions, and glazing stops from aluminum as follows:

1. Profile: Manufacturer's standard, with minimum face dimension indicated.

a. Minimum Face Dimension: 2 inches.

2. Depth: Manufacturer's standard.
3. Provide thermally broken construction for aluminum framing.

D. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."

E. Materials:

1. Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.

2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with **G60** zinc (galvanized) or **A60** zinc-iron-alloy (galvannealed) coating designation.
4. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
5. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
6. Aluminum Extrusions: **ASTM B221**. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than **22,000-psi** ultimate tensile strength.
7. Aluminum Sheet and Plate: **ASTM B209**.

2.2 FIXED, TRANSACTION SECURITY WINDOWS

A. Fixed, Transaction Security Windows: Provide fixed, transaction security windows with operable sash or ventilator capable of allowing transfer of currency and documents.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bandit Barrier; by Diebold Nixdorf, Inc. or comparable product by one of the following:

    a. C.R. Laurence Co., Inc.; CRH Americas, Inc.
    b. Quikserv, Inc.
    c. Ballistic Glass & Armor Solutions, llc

B. Configuration: One fixed-glazed panel.

C. Framing: Fabricate perimeter framing, mullions, and glazing stops from stainless steel as follows:

1. Profile: Manufacturer's standard, with minimum face dimension indicated.

    a. Minimum Face Dimension: As indicated on Drawings.

2. Depth: Manufacturer's standard.
3. Provide thermally improved construction for aluminum framing.

D. Head and Jamb Framing: Designed for gasket glazing.

E. Channel-Frame Sill: Formed from stainless steel and designed for sealant glazing.

1. Transaction Counter: Stainless steel, 18 inches deep by width of security window, with integral deal tray centered in opening.

F. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."

G. Glazing Meeting Edges: Polished glazing.

H. Materials:

1. Mild Steel Plates, Shapes, and Bars: ASTM A36/A36M.
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Metallic-Coated Steel Sheet: ASTM A653/A653M, CS (Commercial Steel), Type B; with **G60** zinc (galvanized) or **A60** zinc-iron-alloy (galvannealed) coating designation.
4. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
5. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
6. Aluminum Extrusions: **ASTM B221**. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than **22,000-psi** ultimate tensile strength.
7. Aluminum Sheet and Plate: **ASTM B209**.

I. Glazing and Glazing Materials: Comply with requirements in Section 088853 "Security Glazing."

1. Glazing Meeting Edges: Polished glazing.

2.3 FABRICATION

A. General: Fabricate security windows to provide a complete system for assembly of components and anchorage of window units.

1. Provide units that are reglazable from the secure side without dismantling the attack side of framing.
2. Prepare security windows for field glazing unless preglazing at the factory is indicated.

B. Framing: Miter or cope corners the full depth of framing; weld and dress smooth.

1. Fabricate framing with manufacturer's standard, internal opaque armoring in thicknesses required for security windows to comply with ballistics-resistance performance indicated.

C. Glazing Stops: Finish glazing stops to match security window framing.

1. Attack-Side (Exterior) Glazing Stops: Welded or integral to framing.
2. Secure-Side (Interior) Glazing Stops: Removable, coordinated with glazing indicated.

D. Welding: Weld components to comply with referenced AWS standard. To greatest extent possible, weld before finishing and in concealed locations to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

E. Metal Protection: Separate dissimilar metals to protect against galvanic action by

painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

F. Factory-cut openings in glazing for speaking apertures.

G. Preglazed Fabrication: Preglaze window units at factory, where required for applications indicated. Installation orientation of glazing to meet performance requirements. Comply with requirements in Section 088853 "Security Glazing."

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 STEEL FINISHES

A. Factory Prime Finish: After surface preparation and pretreatment, apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer.

B. Baked-Enamel or Power-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of **2 mils**.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.6 STAINLESS STEEL FINISHES

A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

1. Run grain of directional finishes with long dimension of each piece.
2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

C. Stainless Steel Sheet and Plate Finishes:

1. Directional Satin Finish: ASTM A480/A480M, No. 4.

2.7 ACCESSORIES

A. Recessed Deal Trays: Formed from stainless steel; fabricated in curved shape with exposed flanges for recessed installation into horizontal surface.

1. Clear Opening Size: 12 inches wide by 8 inches deep by 1-1/2 inches high.

B. Speaking Apertures: Fabricate from stainless steel, designed to allow passage of speech at normal speaking volume without distortion.

1. Shape: Circular.
2. Ballistics Resistance: Same as security window.
3. Listed and labeled as bullet resisting in accordance with UL 752.

C. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.

D. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified testing agency; of type indicated below.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A27/A27M cast steel or ASTM A47/A47M malleable iron. Provide bolts, washers, and shims as required; hot-dip galvanized in accordance with ASTM A153/A153M or ASTM F2329/F2329M.

E. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum **3/16 inch** thick; with minimum **1/2-inch-** diameter, headed studs welded to back of plate.

F. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

G. Glazing Strips and Weather Stripping: Manufacturer's standard replaceable components.

1. Compression Type: Molded EPDM or neoprene gaskets complying with ASTM D2000, Designations 2BC415 to 3BC620; molded PVC gaskets complying with ASTM D2287; or molded, expanded EPDM or neoprene gaskets complying with ASTM C509, Grade 4.
2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric backing.

H. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers and with a proven record of compatibility with surfaces contacted in installation.

1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
2. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

3. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

I. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, complying with ASTM B633; provide sufficient strength to withstand design pressures indicated.

J. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

K. Sealants: For sealants required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Sealant remains permanently elastic, nonshrinking, and nonmigrating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of security windows.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations of security window connections before security window installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of security windows.

D. Inspect built-in and cast-in anchor installations, before installing security windows, to verify that anchor installations comply with requirements. Prepare inspection reports.

1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
2. Perform additional inspections to determine compliance of replaced or additional work. Prepare anchor inspection reports.

E. For factory-installed glazing materials whose orientation (secure or attack side) is critical for performance, verify installation orientation.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing security windows to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.

B. Glazed Framing: Provide gasket-glazed framing. Comply with installation requirements in Section 088853 "Security Glazing."

C. Removable Glazing Stops and Trim: Fasten components with security fasteners.

D. Fasteners: Install security windows using fasteners recommended by manufacturer with head style appropriate for installation requirements, strength, and finish of adjacent materials.

E. Sealants: Comply with requirements in Section 079200 "Joint Sealants" for installing sealants, fillers, and gaskets.

1. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction unless otherwise indicated.
2. Seal frame perimeter with sealant to provide weathertight construction unless otherwise indicated.

F. Metal Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.3 FIELD QUALITY CONTROL

A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

B. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

C. Prepare field quality-control certification that states installed products and their installation comply with requirements in the Contract Documents.

3.4 CLEANING AND PROTECTION

A. Clean surfaces promptly after installation of security windows. Take care to avoid damaging the finish. Remove excess glazing and sealant compounds, dirt, and other substances.

1. Lubricate transaction drawer hardware.

B. Clean glass of preglazed security windows promptly after installation. Comply with requirements in Section 088853 "Security Glazing" for cleaning and maintenance.

C. Provide temporary protection to ensure that security windows are without damage at time of Substantial Completion.

END OF SECTION 08 56 53

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.

5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.

c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

J. Supplier of materials and labor to be ASSA ABLOY and CI Certified

K. Submittals to be stamped by AHC with DHI stamp/seal program certification.

L. Door hardware to be preinstalled on doors by supplying distributor.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.2 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

a. Pemko (PE).

2.3 FLOOR CLOSERS AND PIVOTS

2.4 POWER TRANSFER DEVICES

A. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:

a. Rockwood (RO).

B. Coordinators: ANSI/BHMA A156.3 door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

a. Rockwood (RO).

C. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
6. Manufacturers:

    a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. New System: Key locks to a new key system as directed by the Owner.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).

3. Construction Keys (where required): Ten (10).
4. Construction Control Keys (where required): Two (2).
5. Permanent Control Keys (where required): Two (2).

F. Construction Keying: Provide temporary keyed construction cores.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

H. Cylinder Type: Mortise

1. Manufacturers:

a. Sargent Manufacturing (SA) – Degree.
b. Best (BE) – Coremax.

2.7 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.8 MORTISE LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): Provide ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed mortise locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Sargent Manufacturing (SA) - 8200 Series.

2.9 DEADLOCKS AND LATCHES

A. Narrow Case Deadlocks and Deadlatches: ANSI/BHMA 156.13 Series 1000 Grade 1 narrow case deadlocks and deadlatches for swinging or sliding door applications. All functions shall be manufactured in a single sized case formed from 12 gauge minimum, corrosion resistant steel (option for fully stainless steel case and components). Provide minimum 2 7/8" throw laminated stainless steel bolt. Bottom rail deadlocks to have 3/8” diameter bolts.

1. Manufacturers:

    a. Adams Rite Manufacturing (AD) - 4900 Series.

2.10 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.11 ELECTROMAGNETIC LOCKING DEVICES

A. Surface Electromagnetic Locks (Commercial Duty): Electromagnetic locks to be surface mounted type conforming to ANSI A156.23, Grade 1 with minimum holding force strength of 600 pounds. Locks to be capable of either 12 or 24 voltage and be UL listed for use on fire rated door assemblies. Electronics are to be fully sealed against tampering and allow exterior weatherproof applications. As indicated in Hardware Sets, provide specified mounting brackets and housings. Power supply to be by the same manufacturer as the lock with combined products having a lifetime replacement warranty.

1. Manufacturers:

    a. Securitron (SU) - M32/M38 Series.

2.12 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..

1. Manufacturers:

a. Norton Rixson (NO) - 7500 Series.
b. Sargent Manufacturing (SA) - 351 Series.

2.13 OVERHEAD CONCEALED DOOR CLOSERS

A. Door Closers, Overhead Concealed (Narrow Profile): ANSI/BHMA 156.4 Grade 1 Certified Products Directory (CPD) listed door closers designed for narrow profile frames and doors. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide overhead concealed doors closers with functions and features as follows:

a. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies and A117.1 Accessibility Code.
b. Single acting, offset hung with a cast iron body.
c. Fully concealed body in the frame head and track assembly in the door.
d. Separate and independent valves for closing speed and backcheck adjustments.
e. Five-year limited warranty.

2. Manufacturers:

a. Norton Rixson (RF) - 91DCP Series.

2.14 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:

    a. Rockwood (RO).

2.15 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood (RO).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (RF).

2.16 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and

provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.17 ELECTRONIC ACCESSORIES

A. Request-to-Exit Motion Sensor: Request-to-Exit Sensors motion detectors specifically designed for detecting exiting through a door from the secure area to a non-secure area. Include built-in timers (up to 60 second adjustable timing), door monitor with sounder alert, internal vertical pointability coverage, 12VDC or 24VDC power and selectable relay trigger with fail safe/fail secure modes.

1. Manufacturers:

a. Securitron (SU) - XMS Series.

B. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

C. Switching Power Supplies: Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Power supplies shall meet all functions and features as specified herein.

a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.
b. Tolerates brownout or overvoltage input ± 15% of nominal voltage.
c. Thermal shutdown protection with auto restart.
d. Circuit breaker protection against overcurrent and reverse battery faults.
e. Integrated battery charging circuit to prevent overvoltage on locking devices.
f. Available with a single relay fire trigger or individually triggered relayed outputs.
g. Monitoring options as specified.

2. Manufacturers:

a. Securitron (SU) - AQD Series.

2.18 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.19 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted.

Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer's Abbreviations:

1. MK - McKinney
2. DD - D & D Technologies
3. PE - Pemko
4. RO - Rockwood
5. SA - SARGENT
6. AD - Adams Rite
7. SU - Securitron
8. RF - Rixson
9. OT - Other

Hardware Sets

Set: 1.0

Doors: 101

1 Continuous Hinge	CFM__SLI-HD1 SER		PE
1 Electrified Deadlatch	4300-M	628	AD
1 Lever Operator	4600 (deadlatches)	US32D	AD
1 Permanent Core	DG1 6300	US15	SA
1 I.C. Mortise Cylinder	DG164 41	US32D	SA
1 Offset Pull (TB)	RM222 Mtg-Type 12XHD	US32D	RO
1 Concealed Closer	91NDCP	689	RF
1 Sweep	315CN		PE
1 Threshold	2727A (Or as detailed)		PE
1 ElectroLynx Harness (Door)	QC-CXXXP		MK
1 ElectroLynx Harness (Frame)	QC-CXXX		MK
1 Position Switch	DPS-M-BK		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT

Notes: All wiring, conduit, low voltage, wiring diagrams, and security by Div. 28
Doors normally closed and locked. Entering proper credentials allows ingress. Egress always allowed. Key override available for ingress.
Mount lever trim on push side of opening.
Perimeter gasketing to be furnished by the storefront door supplier.

Set: 2.0

Doors: 110D, 201A, 201B, 301B, 302B, 309B, 401A, 401B, 501

2 Hinge, Full Mortise	TA2314 NRP	US32D	MK
1 Hinge, Full Mortise	TA2314 QC	US32D	MK
1 Electro Mechanical Mort Lock	DG164 RX 8271 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Door Stop	466-RKW	Black	RO
1 Gasketing	303AS		PE
1 Rain Guard	346C		PE
1 Sweep	315CN		PE
1 Threshold	158A (Or as detailed)		PE
1 ElectroLynx Harness (Door)	QC-CXXXP		MK
1 ElectroLynx Harness (Frame)	QC-CXXX		MK
1 Position Switch	DPS-M-BK		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT

Notes: All wiring, conduit, low voltage, wiring diagrams, and security by Div. 28
Doors normally closed and locked. Entering proper credentials allows ingress. Egress always allowed. Key override available for ingress.

Set: 3.0

Doors: 310B, 310C

1 Continuous Hinge	CFM__SLI-HD1 SER		PE
1 Electro Mechanical Mort Lock	DG164 RX 8271 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Door Stop	466-RKW	Black	RO
1 Gasketing	303AS		PE
1 Rain Guard	346C		PE
1 Sweep	315CN		PE
1 Threshold	158A (Or as detailed)		PE
1 ElectroLynx Harness (Door)	QC-CXXXP		MK
1 ElectroLynx Harness (Frame)	QC-CXXX		MK

1 Position Switch	DPS-M-BK		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT

Notes: All wiring, conduit, low voltage, wiring diagrams, and security by Div. 28
Doors normally closed and locked. Entering proper credentials allows ingress. Egress always allowed. Key override available for ingress.

Set: 4.0

Doors: 110A

1 Continuous Hinge	CFM__SLI-HD1		PE
1 Push Bar & Pull	11147 Mtg-Type 5	US32D	RO
1 Concealed Closer	91NDCP	689	RF

Notes: Perimeter gasketing to be furnished by the storefront door supplier.

Set: 5.0

Doors: 107, 108

2 Hinge, Full Mortise	TA2714	US26D	MK
1 Hinge, Full Mortise	TA2714 QC	US26D	MK
1 Electro Mechanical Mort Lock	DG164 RX 8271 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO
1 ElectroLynx Harness (Door)	QC-CXXXP		MK
1 ElectroLynx Harness (Frame)	QC-CXXX		MK
1 Position Switch	DPS-M-BK		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT

Notes: All wiring, conduit, low voltage, wiring diagrams, and security by Div. 28
Doors normally closed and locked. Entering proper credentials allows ingress. Egress always allowed. Key override available for ingress.

Set: 6.0

Doors: 110B, 110C

2 Hinge, Full Mortise	TA2714 NRP	US26D	MK
1 Hinge, Full Mortise	TA2714 QC	US26D	MK
1 Electro Mechanical Mort Lock	DG164 RX 8271 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Conc Overhead Stop	1-X36	630	RF
3 Silencer	608-RKW		RO
1 ElectroLynx Harness (Door)	QC-CXXXP		MK
1 ElectroLynx Harness (Frame)	QC-CXXX		MK
1 Position Switch	DPS-M-BK		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT

Notes: All wiring, conduit, low voltage, wiring diagrams, and security by Div. 28
Doors normally closed and locked. Entering proper credentials allows ingress. Egress always allowed. Key override available for ingress.

Set: 7.0

Doors: 111

6 Hinge, Full Mortise	TA2714 NRP	US26D	MK
2 Flush Bolt (Man. Hm)	555	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom/Closet Lock	DG164 8204 LNMD	US26D	SA
2 Conc Overhead Stop	1-X36	630	RF
2 Silencer	608-RKW		RO

Set: 8.0

Doors: 109

3 Hinge, Full Mortise	TA2714 NRP	US26D	MK
1 Storeroom/Closet Lock	DG164 8204 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
2 Conc Overhead Stop	1-X36	630	RF

3 Silencer	608-RKW		RO

Set: 9.0

Doors: 308

3 Hinge, Full Mortise, Hvy Wt	T4A3786	US26D	MK
1 Storeroom/Closet Lock	DG164 8204 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO

Set: 10.0

Doors: 307, 309A

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Storeroom/Closet Lock	DG164 8204 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO

Set: 11.0

Doors: 102, 103, 104, 105, 106, 305

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office/Entry Lock	DG164 8205 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO
1 Coat Hook	RM802	US26D	RO

Set: 12.0

Doors: 114

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Office/Entry Lock	DG164 8205 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA

1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO

Set: 13.0

Doors: 302A

6 Hinge, Full Mortise	TA2714 NRP	US26D	MK
1 Flush Bolt (Combo Hm)	2845	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Classroom Lock	DG164 8237 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Coordinator	2600	Black	RO
2 Mounting Bracket	2601D	Black	RO
2 Surface Closer	351 P10	EN	SA
2 Kick Plate	K1050 10" x 1" LDW CSK BEV	US32D	RO
2 Conc Overhead Stop	1-X36	630	RF
2 Silencer	608-RKW		RO

Set: 14.0

Doors: 115

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Classroom Lock	DG164 8237 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO

Set: 15.0

Doors: 310A

1 Continuous Hinge	CFM__SLI-HD1		PE
1 Classroom Lock	DG164 8237 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
3 Silencer	608-RKW		RO

Set: 16.0

Doors: 301A

3 Hinge, Full Mortise	TA2714 NRP	US26D	MK
1 Classroom Lock	DG164 8237 LNMD	US26D	SA
1 Permanent Core	DG1 6300	US15	SA
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Conc Overhead Stop	1-X36	630	RF
3 Silencer	608-RKW		RO

Set: 17.0

Doors: 304

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Privacy Lock	V21 8265 LNMD	US26D	SA
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" X 1" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
1 Gasketing	S88BL		PE
1 Coat Hook	RM802	US26D	RO

Set: 18.0

Doors: 112, 113

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Push Pull	111x73C/73CL	US32D	RO
1 Surface Closer	351 O	EN	SA
1 Kick Plate	K1050 10" X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" X 1" LDW CSK BEV	US32D	RO
1 Wall Stop (Convex)	406	US26D	RO
1 Gasketing	S88BL		PE

Set: 19.0

Doors: 201C, 201D, 301C, 302C, 303, 310D, 310E, 401C, 401D

1 Permanent Core	DG1 6300	US15	SA
1 I.C. Mortise Cylinder	DG164 41	US32D	SA

1 All Materials	By Door Manufacturer		OT

Set: 20.0

Doors: 201E

2 Hinge Set	CI3850 + CI3000		DD
2 Magnetic Lock	M32BD		SU
2 Vandal Resistant Trim	VRT26	US32D	RO
2 ElectroLynx Harness (Frame)	QC-CXXX		MK
2 Magnetic Lock Mounting Brackets	As required		OT
1 Motion Sensor	XMS		SU
1 Pushbutton	EEB2		SU
1 Power Supply	AQD1		SU
1 Card Reader	By Security Integrator		OT
1 Balance of Hardware	By Door Manufacturer		OT

Notes: All wiring, wiring diagrams, conduit, low voltage, and security by Div. 28.
Presenting credentials releases magnetic hold on lock and allows ingress.
Egress always allowed via motion sensor at interior side of door, or by pressing emergency release button.

END OF SECTION 087100

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass products.
2. Insulating glass.
3. Acid-etched insulating glass
4. Glazing tapes.
5. Miscellaneous glazing materials.

B. Related Requirements:

1. Section 088853 "Security Glazing."

1.2 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of the following products; **12 inches** square.

1. Coated glass.
2. Insulating glass.
3. Spandrel glass.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturers of fabricated glass units.

B. Product Certificates: For glass.

C. Product Test Reports: For fabricated glass glazing sealants, for tests performed by a qualified testing agency.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved by primary glass manufacturer.

B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below **40**

deg F.

1.9 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Heat-Soaked Tempered Glass: Manufacturer agrees to replace heat-soaked tempered glass units that spontaneously break due to nickel sulfide (NiS) inclusions at a rate exceeding 0.3 percent (3/1000) within specified warranty period. Coverage for any other cause is excluded.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations for Glass: Obtain glass from single source from single manufacturer.

B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section

014000 "Quality Requirements," to design glazing.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:

1. Design Wind Pressures: Determine design wind pressures applicable to Project in accordance with ASCE/SEI 7, based on heights above grade indicated on Drawings.

   a. Wind Design Data: As indicated on Drawings.

2. Design Snow Loads: As indicated on Drawings.
3. Probability of Breakage for Sloped Glazing: For glass sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or **1 inch**, whichever is less.
5. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
4. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as **Btu/sq. ft. x h x deg F**.
5. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
6. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
2. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
3. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Cardinal Glass Industries, Inc.
b. Guardian Glass LLC
c. Pilkington North America; NSG Group
d. Saint-Gobain Glass Corp
e. Vitro Architectural Glass

B. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

C. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

D. Reflective- and Low-E-Coated Vision Glass: ASTM C1376.

1. Manufacturers: Subject to compliance with requirements, available

manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Cardinal Glass Industries, Inc.
b. Guardian Glass LLC
c. Pilkington North America; NSG Group
d. Saint-Gobain Glass Corp
e. Vitro Architectural Glass

E. Fully Tempered Acid-etched Spandrel Glass: ASTM C1048, Kind FT, Type I, Condition C, Quality-Q3

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.

1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks:

1. Type recommended in writing by sealant or glass manufacturer.

D. Spacers:

1. Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks:

1. Type recommended in writing by sealant or glass manufacturer.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.

3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than **50 inches**.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide **1/8-inch-** minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense

compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.7 MONOLITHIC GLASS SCHEDULE

A. Clear Glass Type G1: Fully tempered float glass.

1. Minimum Thickness: 1/4 inch.
2. Safety glazing required.

B. Clear Glass Type G7: Annealed Float glass

1. Minimum Thickness: 1/8 inch

3.8 INSULATING GLASS SCHEDULE

A. Clear Insulating Glass Type G3:

1. Basis-of-Design Product: Guardian Industries Corp. or approved equal..
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Fully tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully tempered float glass.
7. Safety glazing required.

B. Low-E-Coated, Clear Insulating Glass Type G2:

1. Basis-of-Design Product: Guardian Industries Corp. or approved equal.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Annealed float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Annealed float glass.
7. Low-E Coating: Pyrolytic on second surface.

C. Low-E-Coated, Clear Insulating Glass Type G4:

1. Basis-of-Design Product: Guardian Industries Corp. or approved equal.
2. Overall Unit Thickness: **1 inch**.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Fully Tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully Tempered float glass.
7. Low-E Coating: Pyrolytic on second surface.
8. Safety Glazing Required

END OF SECTION 08 80 00

SECTION 08 88 53 - SECURITY GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Laminated-glass security glazing

B. Related Requirements:

1. Section 085653 "Security Windows."

1.2 DEFINITIONS

A. Glazing Manufacturers: Firms that produce primary glass, monolithic plastic glazing, or fabricated security glazing, as defined in referenced glazing publications.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on security glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification:

1. Glazing: Actual sample of finished products for each type of security glazing.

a. Size: Manufacturers' standard size.

2. Glazing Accessories: Actual sample of sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
3. Size: Manufacturers' standard size.

C. Security Glazing Schedule: List security glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of security glazing and construction that receives security glazing, including clearances and glazing channel dimensions.

1.5 INFORMATIONAL SUBMITTALS

A. Test and Evaluation Reports:

1. Product Test Reports:

a. For each type of security glazing, for tests performed by qualified testing agency.
b. For each type of glazing sealant, for tests performed by a qualified testing agency.

1) Provide test reports based on testing current sealant formulations within previous 36-month period.

2. Preconstruction Test Reports: For preconstruction adhesion and compatibility testing.

B. Qualification Statements: For installers.

C. Sample warranties.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Authorized representative who is trained and approved by manufacturer.
2. Security Glazing Testing Agency: Subject to compliance with requirements, testing agency is one of the following:

a. Intertek.
b. Underwriters Laboratories, Inc.
c. Wiss, Janney, Elstner Associates, Inc.
d. <**Insert testing agency name**>.

3. Sealant Testing Agency: An independent testing agency qualified in accordance with ASTM C1021 to conduct the testing indicated.

1.7 MOCKUPS

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect security glazing and glazing materials according to manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers

and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below **40 deg F**.

1.10 WARRANTY

A. Special Warranty, Coated Glass: Manufacturer agrees to replace coated glass that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Defects developed in coated glass from normal use that is not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Warranty, Laminated-Glass Security Glazing: Manufacturer agrees to replace laminated-glass security glazing that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated-glass security glazing contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of security glazing from single source from single manufacturer.

B. Obtain glazing sealants and gaskets from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

A. General:

1. Installed security glazing will withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
2. Installed security glazing will withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.

B. Structural Performance: Glazing will withstand the following design loads within limits and under conditions indicated.

1. Design Procedure for Glass: ASTM E1300 and the IBC.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

2.3 SECURITY GLAZING, GENERAL

A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA Publications: "Laminated Glazing Reference Manual" and"GANA Glazing Manual."

2.4 GLASS PRODUCTS

A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

2.5 LAMINATED-GLASS SECURITY GLAZING

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. OldCastle BuildingEnvelope (OBE)
2. Ballistic Glass & Armor Solutions, LLC

B. Laminated-Glass Security Glazing: ASTM C1172. Two or more glass lites bonded with interlayer. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
2. Interlayer Color: Clear unless otherwise indicated.

2.6 SPALL-RESISTANT FILM

A. Laminating Process: Factory laminate spall-resistant film to glazing assemblies to produce laminated lites free of foreign substances, air, and glass pockets.

2.7 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they contact, including security glazing, seals of insulating security glazing and air-gap security glazing, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and security glazing manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of Industry colors.

B. Glazing Sealant:

C. Security Sealant: Manufacturer's standard, nonsag, tamper-resistant sealant for joints with low movement complying with ASTM C920, Grade NS, Class 12.5 or 25, Use NT, and with a Shore A hardness of at least 45 when tested in accordance with ASTM C661.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and security glazing manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of security glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks:

1. Type recommended in writing by sealant or glass manufacturer.

D. Spacers:

1. Type recommended in writing by sealant or security glazing manufacturer.

E. Edge Blocks:

1. Type recommended in writing by sealant or security glazing manufacturer.

2.10 FABRICATION OF SECURITY GLAZING

A. Fabricate security glazing in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Grind smooth and polish exposed security glazing edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing for security glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Minimum required bite.

5. Effective sealing between joints of framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving security glazing immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of security glazing, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect edges of security glazing from damage during handling and installation. Remove damaged security glazing from Project site and legally dispose of it off Project site. Damaged security glazing includes units with edge or face damage or other imperfections that, when installed, could weaken security glazing and impair performance and appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glazing unit manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by security glazing manufacturers for installing lites.

F. Provide spacers for security glazing lites where the length plus width is larger than **50 inches**.

1. Locate spacers directly opposite each other on both inside and outside faces of security glazing. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with performance requirements.
2. Provide **1/8-inch** minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness of slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent security glazing from moving sideways in glazing channel, as recommended in writing by security glazing manufacturer and in accordance with requirements in referenced glazing publications.

H. Set security glazing in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set coated security glazing with proper orientation so that coatings and films face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by security glazing, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center security glazing in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended in writing by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glazing unit and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center security glazing in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center security glazing in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between security glazing and glazing stops to maintain face clearances and to prevent sealant from extruding into glazing channel and blocking weep systems. Secure spacers, or spacers and backings, in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to security glazing and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from security glazing.

3.7 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect security glazing from contact with contaminating substances resulting from construction operations, including weld splatter. Examine security glazing surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do contact with security glazing, remove substances immediately as recommended in writing by security glazing manufacturer. Remove and replace security glazing that cannot be cleaned without damage.

C. Wash security glazing on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash security glazing as recommended in writing by security glazing manufacturer.

3.8 LAMINATED-GLASS SECURITY GLAZING SCHEDULE

A. Security Glazing: Clear laminated glass.

1. Label on drawings: Type G6
2. Forced-Entry Resistance, ASTM F1233: Class 2.0 in accordance with ASTM F1233.
3. Ballistic Resistance, UL 752: Level 2 in accordance with UL 752.
4. Maximum Overall Unit Thickness: 1.31 in..

END OF SECTION 08 88 53

SECTION 09 21 16.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gypsum board shaft wall assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assemblies.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage.

B. Stack shaftliner and face panels flat and support them on risers on a flat platform to prevent sagging.

C. Protect steel framing from corrosion, deformation, and other damage during delivery, storage, and handling in accordance with AISI S202.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.

B. Do not install finish panels until installation areas are enclosed and conditioned.

C. Do not install shaftliner and face panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to rated assembly indicated on Drawings tested in accordance with ASTM E119 by an independent testing agency.

2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

A. Fire-Resistance Rating: As indicated on Drawings.

B. Gypsum Shaftliner Board:

1. Type X: ASTM C1396/C1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, **1 inch** thick, with double beveled long edges.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1) American Gypsum
2) Georgia-Pacific Gypsum LLC
3) PABCO Gypsum

C. Steel Framing, General: Complying with applicable requirements in AISI S220 and complying with requirements for fire-resistance-rated assemblies indicated on Drawings.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. ClarkDietrich
b. Marino\WARE
c. SCAFCO Steel Stud Company; Stone Group of Companies
d. Steel Construction Systems; Stone Group of Companies

2. Protective Coating: ASTM A653/A653M, G40 or coating with demonstrated equivalent corrosion resistance. Galvannealed products are unacceptable.

a. Equivalent Corrosion Resistance: Evaluation report acceptable to authorities having jurisdiction demonstrates corrosion resistance equivalent to specified protective coating.

D. Studs: Profiles required for fire-resistance-rated assembly indicated on Drawings for repetitive, corner, and end members as follows:

1. Depth: 2-1/2 inches.
2. Minimum Base-Steel Thickness: Per UL assembly listed on drawings.

E. Track: J-profile track required for fire-resistance-rated assembly indicated on Drawings with minimum long-leg length of 2 inches and matching studs in depth.

1. Minimum Base-Steel Thickness: Matching steel studs.

F. Finish Panels: Gypsum board as specified in Section 092900 "Gypsum Board."

2.3 ACCESSORIES

A. Provide accessories that comply with shaft wall manufacturer's written instructions.

B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 092900 "Gypsum Board" that comply with shaft wall assembly manufacturer's written instructions for application indicated on Drawings.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated on Drawings.

D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

1. Expansion Anchors: Fastener systems with an evaluation report, acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.
2. Power-Actuated Anchors: Fastener systems with an evaluation report, acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Reinforcing: Steel reinforcing strips of corrosion-resistant steel complying with steel framing requirements and in 0.33-inch minimum base-steel thickness.

F. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

G. Gypsum Board Cants:

1. Gypsum Board Panels: As specified in Section 092900 "Gypsum Board," Type X, 1/2- or 5/8-inch panels.
2. Adhesive: Laminating adhesive as specified in Section 092900 "Gypsum Board."
3. Non-Structural Steel Framing: As specified in Section 092216 "Non-Structural Metal Framing."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine shaftliner and face panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF GYPSUM BOARD SHAFT WALL ASSEMBLIES

A. General: Install shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated on Drawings and manufacturer's written installation instructions.

B. Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.

C. Install supplementary framing in shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.

1. Reinforcing: Provide where items attach directly to shaft wall assembly as indicated on Drawings; accurately position and secure behind at least one layer of face panel.

D. Penetrations: At penetrations in shaft wall assemblies, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons and floor indicators, and similar items.

E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.

F. Control Joints: Install control joints in accordance with ASTM C840 and in specific locations approved by Architect while maintaining fire-resistance rating of shaft wall assemblies.

G. Sound-Rated Shaft Wall Assemblies: Seal with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.

H. Gypsum Board Cants: At projections into shaft exceeding 4 inches, install gypsum board cants covering tops of projections.

1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at **24 inches** o.c. with screws fastened to shaft wall framing.
2. Where non-structural steel framing is required to support gypsum board cants, install framing at **24 inches** o.c. and extend studs from the projection to shaft wall framing.

I. Installation Tolerance: Install each framing member so fastening surfaces vary not

more than **1/8 inch** from the plane formed by faces of adjacent framing.

3.3 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace shaftliner and face panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16.23

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonstructural steel framing.
2. Grid suspension systems.

B. Related Requirements:

1. Section 054000 "Cold-Formed Metal Framing" for exterior and interior loadbearing, structural framing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For code-compliance certification of studs and track.

B. Evaluation Reports: From an agency acceptable to authorities having jurisdiction ICC-ES showing compliance with Project requirements, for the following:

1. Power-actuated fasteners.

1.4 QUALITY ASSURANCE

A. Code-Compliance Certification of Studs and Track: Provide documentation that framing members are certified in accordance with product-certification program of the Steel Framing Industry Association the Steel Stud Manufacturers Association or the Supreme Steel Framing System Association.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Protect materials from corrosion, deformation, and other damage during delivery, storage, and handling in accordance with AISI S202.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: Where indicated on Drawings, provide assemblies incorporating nonstructural framing identical to those of assemblies tested in accordance with ASTM E90 and classified in accordance with ASTM E413 by an independent testing agency.

B. Horizontal Deflection: For composite wall assemblies, limited to 1/240 of the wall height based on the following horizontal loading:

1. Horizontal Loading: 5 lbf/sq. ft..

2.2 NONSTRUCTURAL STEEL FRAMING

A. Framing Members, General: Comply with requirements in AISI S220 for conditions indicated on Drawings.

1. Protective Coating: ASTM A653/A653M, G40 or coating with demonstrated equivalent corrosion resistance. Galvannealed products are unacceptable.

a. Equivalent Corrosion-Resistant Coating: Evaluation report acceptable to authorities having jurisdiction demonstrates corrosion resistance equivalent to specified protective coating.

B. Studs and Track: Conventional members, roll-formed into standard shapes without surface deformations to stiffen framing members.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO; California Expanded Metal Products Co.
b. ClarkDietrich
c. Marino\WARE
d. SCAFCO Steel Stud Company; Stone Group of Companies
e. Steel Network, Inc. (The)

2. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
3. Minimum Yield Strength: **33 ksi**.
4. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated on Drawings, provide one of the following:

1. Slotted Deflection Track: Steel sheet top track manufactured with 2-1/2-inch-deep flanges that allow positive attachment to studs through long slots and prevent deflection of structure above from cracking finishes applied to framing; in base-steel thickness not less than that of studs and in width to accommodate depth of studs.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) CEMCO; California Expanded Metal Products Co.
2) ClarkDietrich
3) Marino\WARE
4) SCAFCO Steel Stud Company; Stone Group of Companies
5) Steel Network, Inc. (The)

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated on Drawings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO; California Expanded Metal Products Co.
b. ClarkDietrich
c. Marino\WARE
d. SCAFCO Steel Stud Company; Stone Group of Companies
e. Steel Network, Inc. (The)

2. Minimum Base-Steel Thickness: 0.0296 inch.

E. U-Channel: Cold-rolled steel, **0.0538-inch** minimum base-steel thickness, with minimum **1/2-inch-** wide flanges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO; California Expanded Metal Products Co.
b. ClarkDietrich
c. Marino\WARE
d. SCAFCO Steel Stud Company; Stone Group of Companies
e. Steel Network, Inc. (The)

2. Depth:

a. Bridging: 1-1/2 inches.
b. Suspended-Assembly Carrying Channels (Main Runners): 1-1/2 inches.

3. Bridging Clip Angle: Not less than **1-1/2 by 1-1/2 inches**; **0.068-inch-** base-steel thickness.

F. Rigid Hat-Shaped Furring Channels:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO; California Expanded Metal Products Co.
b. ClarkDietrich
c. Marino\WARE

d. SCAFCO Steel Stud Company; Stone Group of Companies
e. Steel Network, Inc. (The)

2. Minimum Base-Steel Thickness: 0.0179 inch.
3. Depth: As indicated on Drawings.

G. Z-Shaped Furring: With slotted or nonslotted web, face flange of **1-1/4 inches**, wall attachment flange of **3/4 inch**, minimum base-steel thickness of **0.0179 inch**, and depth required to fit insulation thickness indicated on Drawings.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CEMCO; California Expanded Metal Products Co.
b. ClarkDietrich
c. Marino\WARE
d. SCAFCO Steel Stud Company; Stone Group of Companies
e. Steel Network, Inc. (The)

H. Column Connection: 1. GripClip by The Steel Network, Inc. or equal system by one of the listed previously listed manufacturers.

2.3 GRID SUSPENSION SYSTEMS

A. Grid Suspension Systems for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Armstrong World Industries
b. CertainTeed; SAINT-GOBAIN
c. USG Corporation

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.

1. Suspended-Ceiling Systems:

a. Splicing Carrying Channels and Furring Members: Use double loops of minimum **0.0625-inch-** diameter wire.
b. Saddle Tying Main Runners and Cross Furring: Use minimum **0.0625-inch-** diameter wire, or double strand of **0.0475-inch-** diameter wire.

C. Post-Installed Anchors: Fastener systems with an evaluation report, acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.

1. Securing Hangers:

a. Type: Torque-controlled, expansion anchor.
b. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated on Drawings.
c. Stainless Steel Material for Exterior or Interior Locations: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

D. Power-Actuated Anchors: Fastener systems with an evaluation report, acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.162 inch in diameter.

F. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, **1/8 inch** thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, substrates, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

3.3 INSTALLATION OF NONSTRUCTURAL METAL FRAMING, GENERAL

A. Installation Standard: ASTM C754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with framing members. Frame both sides of joints independently.

3.4 INSTALLATION OF NONSTRUCTURAL STEEL FRAMING

A. Install framing system components at spacings indicated on Drawings, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated on Drawings.
2. Tile Backing Panels: As required by horizontal deflection performance requirements unless otherwise indicated on Drawings.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install track at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated on Drawings to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated on Drawings.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum **1/2-inch** clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure unless otherwise indicated on Drawings.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated on Drawings. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated on Drawings and support closures to make partitions continuous from floor to underside of solid structure.
5. STC-Rated Partitions: Install framing to comply with STC-rated assembly indicated on Drawings.
6. Curved Partitions:

    a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of at least two studs at ends of arcs, place studs **6 inches** o.c.

E. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced **24 inches** o.c.

F. Wall-Furring Bracket Systems: Install brackets with serrated edges facing upward spaced at minimum **48 inches** o.c. vertically with **6 inches** maximum from floor and ceiling, and minimum **36 inches** o.c. horizontally with **4 inches** maximum from abutting construction, unless otherwise indicated on Drawings.

G. Z-Shaped Furring Members:

1. Erect insulation, specified in Section 072100 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced **24 inches** o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than **12 inches** from corner and cut insulation to fit.

H. Suspended Assemblies: Isolate suspension assemblies from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

1. Hangers: Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system spaced as indicated on Drawings.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
b. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

1) Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

c. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause

hangers to deteriorate or otherwise fail.

d. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
e. Do not attach hangers to steel roof deck.
f. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
g. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
h. Do not connect or suspend framing from ducts, pipes, or conduit.

2. Carrying Channels (Main Runners): U-channels spaced as indicated on Drawings.
3. Furring Channels (Furring Members): As indicated on Drawings.

a. Spacing: As indicated on Drawings.
b. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

I. Installation Tolerances for Nonstructural Steel Framing:

1. Framing Members: Install each framing member so fastening surfaces vary not more than **1/8 inch** from the plane formed by faces of adjacent framing.
2. Suspended Assemblies: Install suspension systems that are level to within 1/8 inch in 12 ft. measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 INSTALLATION OF GRID SUSPENSION SYSTEMS

A. Grid Suspension Systems: Install in accordance with manufacturer's written instructions. Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

B. Installation Tolerances for Grid Suspension Systems: Install suspension systems that are level to within 1/8 inch in 12 ft. measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1. Section 079219 "Acoustical Joint Sealants" for acoustical joint sealants installed in gypsum board assemblies.
2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for steel shaft wall framing, gypsum shaft liners, and other components of shaft wall assemblies.
3. Section 092216 "Non-Structural Metal Framing" for nonstructural steel framing and suspension systems that support gypsum board panels.
4. Section 093013 "Ceramic Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Locations and installation of control and expansion joints, including plans, elevations, sections, and attachment details.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.4 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings in accordance with ASTM E119; tested by a qualified testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings in accordance with ASTM E90 and classified in accordance with ASTM E413; tested by a qualified testing agency.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum
b. CertainTeed; SAINT-GOBAIN
c. Gold Bond Building Products, LLC provided by National Gypsum Company
d. USG Corporation

2. Thickness: 5/8 inch.
3. Long Edges: Tapered.

B. Gypsum Ceiling Board: ASTM C1396/C1396M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum
b. CertainTeed; SAINT-GOBAIN

c. Gold Bond Building Products, LLC provided by National Gypsum Company
d. USG Corporation

2. Thickness: 1/2 inch.
3. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C1396/C1396M; manufactured with moisture- and mold-resistant core and paper surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum
b. CertainTeed; SAINT-GOBAIN
c. Gold Bond Building Products, LLC provided by National Gypsum Company
d. USG Corporation

2. Core: 5/8 inch, Type X.
3. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.
4. Long Edges: Tapered.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. PermaBASE Building Products, LLC provided by National Gypsum Company
b. USG Corporation

2. Thickness: 1/2 inch.
3. Mold Resistance: ASTM D3273, score of 10 as rated in accordance with ASTM D3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized-steel sheet or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Cornerbead.
b. Bullnose bead.
c. LC-Bead: J-shaped; exposed long flange receives joint compound.
d. L-Bead: L-shaped; exposed long flange receives joint compound.
e. U-Bead: J-shaped; exposed short flange does not receive joint compound.

f. Expansion (control) joint.
g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M requirements.

1. Mold-Resistant Joint Compound: Use mold-resistant formulations with mold-resistant panel products.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended in writing by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended in writing by backer unit manufacturer.
2. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C1002 unless otherwise specified or indicated on Drawings.

1. Use screws complying with ASTM C954 for fastening panels to steel members from **0.033 to 0.112 inch** thick.
2. For fastening cementitious backer units, use screws of type and size recommended in writing by panel manufacturer.

C. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers as follows:

1. Non-Fire-Resistance-Rated Assemblies: Glass or slag or rock wool.

D. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

A. Comply with ASTM C840 requirements.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft.** in area.

2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch-** wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide **1/4- to 1/2-inch-** wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 requirements and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound-attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Gypsum Wallboard: As indicated on Drawings.
2. Gypsum Board, Type X: As indicated on Drawings.
3. Gypsum Ceiling Board: As indicated on Drawings.
4. Mold-Resistant Gypsum Board: As indicated on Drawings.
5. Acoustically Enhanced Gypsum Board: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated on Drawings.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise specified or indicated on Drawings or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

B. Water-Resistant Backing Board: Install where indicated with **1/4-inch** gap where panels abut other construction or penetrations.

C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLATION OF TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim in accordance with manufacturer's written instructions.

B. Control Joints: Install control joints in accordance with ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Install at outside corners unless otherwise specified or indicated on Drawings.

3.6 APPLICATION OF JOINT TREATMENT MATERIALS

A. Finishing Panel Products: Treat joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare panel surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over panel joints, except for trim products specifically indicated as not intended to receive tape.

D. Interior Gypsum Board: Finish panels to levels indicated below and in accordance with ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Cementitious Backer Units: Finish in accordance with manufacturer's written instructions.

3.7 PROTECTION

A. Protect adjacent surfaces from joint compound and promptly remove from floors and other non-gypsum board surfaces. Repair surfaces stained, marred, or otherwise damaged during gypsum board installation and finishing.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Porcelain Tile
2. Ceramic tile.
3. Metal edge strips.

B. Related Sections:

1. Division 07 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
2. Division 09 Section "Gypsum Board" for glass-mat, water-resistant backer board.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.
2. Step Treads: Minimum 0.6.

3. Ramp Surfaces: Minimum 0.6.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of tile and grout indicated.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

C. Product Certificates: For each type of product, signed by product manufacturer.

D. Material Test Reports: For each tile-setting and -grouting product.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile from one source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

C. Preinstallation Conference: Conduct conference at Project site.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with unbroken seals and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location. Store aggregates where grading and other required characteristics can be maintained, and contamination can be avoided.

C. Store liquid materials in unopened containers and protected from freezing.

D. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.

C. FloorScore Compliance: Tile for floors shall comply with requirements of FloorScore Standard.

D. Factory Blending: For tile exhibiting color variations within ranges, blend tiles in factory and package so tiles units taken from one package show same range in colors as those taken from other packages and match approved Samples.

E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturers specify in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS (WT-1, WT-2)

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings or comparable product by one of the following:

1. Crossville, Inc.
2. Ergon, Inc.

B. Tile Type: Factory-finished porcelain tile. (WT-1)

1. Manufacturer: Daltile; Division of Dal-Tile International Inc.
2. Composition: Porcelain.
3. Module Size: 12 x 24 inches.
4. Thickness: 5/16” (7.94 mm).
5. Face: Plain, with cushion edges.
6. Surface:

    a. Wall Applications Smooth, without Slip Resistant abrasive admixture.

7. Tile Color: Calgary, Fawn CG41
8. Finish: Matte
9. Tile Pattern: As noted on drawing.
10. Grout Color: (GT-1) Mapei 5002 Pewter
11. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

    a. External Corners: Rounded edges.
    b. Internal Corners: Field-butted square corners.

C. Tile Type: Factory-finished ceramic tile. (WT-2)

1. Manufacturer: Daltile; Division of Dal-Tile International Inc.
2. Composition: Ceramic.
3. Module Size: 3 x 6 inches.
4. Thickness: 5/16” (7.94 mm).
5. Face: Plain, with cushion edges.
6. Surface:

    a. Wall Applications Smooth, without Slip Resistant abrasive admixture.

7. Tile Color: Calgary, Fawn CG41
8. Finish: Glossy
9. Tile Pattern: As noted on drawing.
10. Grout Color: (GT-1) Mapei 5002 Pewter

11. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:

    a. External Corners: Rounded edges.
    b. Internal Corners: Field-butted square corners.

2.3 SETTING MATERIALS

A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Manufacturer: MAPEI Corporation.
2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene rubber liquid-latex additive at Project site.
4. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.4 GROUT MATERIALS

A. Polymer-Modified Tile Grout: ANSI A118.7.

1. Manufacturer subject to compliance with requirements:

    a. MAPEI Corporation.

2. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.
3. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

2.5 ELASTOMERIC SEALANTS

A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the requirements in Division OM 07 Section "Joint Sealants."

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

2.6 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: L-shaped or angled, with a height matching the tile and setting-bed thickness. Designed specifically for wall applications with a Schluter curved edge. Constructed from stainless steel.

C. Temporary Protective Coating: Product indicated below is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

1. Grout release in the form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

1. Product subject to compliance with requirements:

a. MAPEI Corporation; KER 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
2. Verify that substrates are smooth and acceptable.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in substrates.

B. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile close to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
2. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Porcelain Wall Tile: 1/16 inch (1.6 mm)

G. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from the effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

B. Protect installed tile work.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 093000

SECTION 09 51 23 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical tiles.
2. Metal edge moldings and trim.

B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product.

B. Samples: For each exposed product and for each color and texture specified, **6 inches** in size.

C. Samples for Initial Selection: For components with factory-applied finishes.

D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:

1. Acoustical Tiles: Set of full-size Samples of each type, color, pattern, and texture.
2. Concealed Suspension-System Members: 6-inch- long Sample of each type.
3. Exposed Moldings and Trim: Set of 6-inch- long Samples of each type and color.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Ceiling suspension-system members.
2. Structural members to which suspension systems will be attached.
3. Method of attaching hangers to building structure.
4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
5. Size and location of initial access modules for acoustical tile.
6. Items penetrating finished ceiling and ceiling-mounted items including the following:

a. Lighting fixtures.
b. Diffusers.
c. Grilles.
d. Speakers.
e. Sprinklers.
f. Access panels.
g. Perimeter moldings.

7. Show operation of hinged and sliding components adjacent to acoustical tiles.
8. Minimum Drawing Scale: 1/8 inch = 1 foot.

B. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical tile ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain components for acoustical panel ceiling assembly from one ceiling manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical tiles, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Source Limitations for Suspended Acoustical Tile Ceiling System: Obtain each type of acoustical ceiling tile and its suspension system from single source from single manufacturer.

B. Source Limitations for Directly Attached Acoustical Tile Ceiling Tile: Obtain each type of acoustical ceiling tile from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Suspended ceilings to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A in accordance with ASTM E1264.
2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL TILES

A. Acoustical Tiles:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Calla by Armstrong World Industries or comparable product by one of the following:

a. CertainTeed; SAINT-GOBAIN
b. USG Corporation

2. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E1264 classifications as designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
3. Classification: Provide tiles as follows:

a. Type and Form, Type III: Mineral base with painted finish; Form 2, water

felted Form 4, cast or molded.
b. Pattern: G (smooth).

4. Color: White.
5. Light Reflectance (LR): Not less than 0.85.
6. Ceiling Attenuation Class (CAC): Not less than 35.
7. Noise Reduction Coefficient (NRC): Not less than 0.85.
8. Articulation Class (AC): Not less than 170.
9. Edge/Joint Detail: Tegular Edge.
10. Thickness: 1 inch.
11. Modular Size: 24 by 24 inch.
12. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested in accordance with ASTM D3273, ASTM D3274, or ASTM G21 and evaluated in accordance with ASTM D3274 or ASTM G21.

2.4 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Metal Edge Moldings and Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Armstrong Ceiling & Wall Solutions
b. CertainTeed; SAINT-GOBAIN
c. USG Corporation

2. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations complying with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for of suspension-system runners.

a. Edge moldings to fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless

otherwise indicated.

b. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.

c. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

d. Finish: Painted to match color of acoustical unit.

3. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.

a. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

b. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of **1.5 mils**. Comply with ASTM C635/C635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.6 ACOUSTICAL SEALANT

A. Acoustical Sealant: As specified in Section 079219 "Acoustical Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

A. Install suspended acoustical tile ceilings in accordance with ASTM C636/C636M, seismic design requirements, and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
3. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than **48 inches** o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than **8 inches** from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.

1. Screw attach moldings to substrate at intervals not more than **16 inches** o.c. and not more than **3 inches** from ends. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Arrange directionally patterned acoustical tiles as follows:

1. As indicated on reflected ceiling plans.

G. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges of tiles so tile-to-tile joints are interlocked.

1. Fit adjoining tiles to form flush, tight joints. Scribe and cut tiles for accurate fit at borders and around penetrations through ceiling.
2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tiles and moldings, spaced **12 inches** o.c.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 ADJUSTING

A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 23

SECTION 096513 – RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Resilient base.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Samples and Product Data for Verification: For each type of product indicated, in manufacturer's standard-size samples for each resilient product color, texture, and pattern required.

B. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Mockups: Provide resilient products with mockups specified in other Sections.

C. Installer Qualifications: Installer must have a minimum of five years experience and have record of 25 projects favorably completed that are similar to this one.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE (RB-1)

A. Resilient Base:

1. Manufacturer subject to compliance with requirements:

a. Tarkett, Johnsonite.
b. Roppe.

B. Resilient Base Standard: ASTM F 1861.

1. Material Requirement: Type TP (rubber, thermoplastic)
2. Manufacturing Method: Group II (layered)
3. Style: Cove (base with toe).

C. Minimum Thickness: 0.125 inch (3.2 mm).

D. Height: 4 inches (102 mm).

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Preformed.

G. Inside Corners: Preformed.

H. RB-1
1. Manufacturer: Tarkett, Johnsonite
2. Color: Moon Rock WG
3. Style: Cove
4. Size: 4 inches.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Accessories: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
4. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are the same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes one resinous flooring system, one with epoxy body.

1. Application Method: Squeegee, screed, and broadcast.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Verification: For each resinous flooring system required, 5 inches (150 mm) square, applied to a rigid backing.

C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

E. Maintenance Data: For resinous flooring to be included in maintenance manuals.

1.4 QUALITY ASSURANCE

A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. epoxy based flake broadcast with mortar coat). Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.

B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.

1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
2. Contractor shall have completed at least 10 projects of similar size and complexity.

C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

E. Pre-installation Conference:
1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
2. Attendance:
   a. General Contractor
   b. Manufacturer/Installer's Representative.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with unbroken seals, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store material per product data sheet.

C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
1. Maintain material and substrate temperature between 65 and 85 deg F (18 and 30 deg C) during resinous flooring application and for not less than 24 hours after application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

D. Concrete substrates shall be properly cured. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

1.7 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full years from date of installation or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 - PRODUCTS

2.1 RESINOUS FLOORING (RF-1)

A. Available Products: Subject to compliance with requirements.
1. Confirm inclusion of 25mil body coat, and broadcast quartz into primer increasing bond strength. Products that may be incorporated into the work.

B. Products: Subject to compliance with requirements:
1. Stonhard, Inc.; Stontec ERF®. Basis of Design.

C. System Characteristics:
1. Color and Pattern: Select from manufactures standards
2. Wearing Surface: Standard
3. Integral Cove Base: Restrooms Only. Refer to finish schedule.
4. Overall System Thickness: 2mm

D. System Components: Manufacturer’s standard components that are compatible with each other and as follows:
1. Primer:
   a. Material Basis: Stonhard Standard Primer
   b. Resin: Epoxy
   c. Formulation Description: (2) two component 100 percent solids.
   d. Application Method: Squeegee and roller.
   e. Number of Coats: (1) one.
   f. Aggregates: Broadcast quartz into wet primer coat.
2. Body Coat(s):
   a. Material Basis: Stonshield Undercoat.
   b. Resin: Epoxy.
   c. Formulation Description: (3) three component solvent free epoxy.

d. Application Method: Notched squeegee.
   1) Thickness of Coats: 25-30 mils with standard primer coat
   2) Number of Coats: (1) One.

3. Broadcast:
   a. Material Basis: Stontec Flakes
   b. Formulation Description: Decorative flake (1/16" or ¼)
   c. Type: Tweed (chips to be mixed in Mfg. facility)
   d. Finish: Broadcast to rejection.
   e. Number of Coats: one.
4. Topcoat:
   a. Material Basis: Stonkote CE4
   b. Resin: Epoxy.
   c. Formulation Description: (2) component, UV stable, solvent free epoxy.
   d. Type: Clear.
   e. Finish: Gloss. (see finish schedule for texture options)
   f. Number of Coats: Two.

E. SYSTEM PHYSICAL PROPERTIES

Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Tensile Strength: 5,200 psi per ASTM D-638
2. Flexural Strength: 4,000 psi per ASTM D-790
3. Flexural Modulus of Elasticity: 1.7 x 10^6 psi per ASTM D-790
4. Hardness: .85 to .90 per ASTM D-2240, Shore D
5. Linear Coefficient of Thermal Expansion: 17 x 10^-6 in./in.℉ per ASTM C-531
6. Impact Resistance: Exceeds 160 in.-lbs. per ASTM D-4060, CS-17
7. Abrasion Resistance: 0.03 gm max. weight loss per ASTM D-4060, CS-17
8. Flammability: Class I per ASTM E-648

2.2 ACCESSORY MATERIALS

A. Patching, Leveling and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated. No Single component or cementitious materials.

B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean and dry substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Mechanically prepare substrates as follows:

a. Mechanically prepare with the use of Diamond grinding equipment to provide surface sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Or,

b. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup or Diamond Grind with a dust free system.

c. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates meet the following requirements.
   a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 80 percent.
   b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab in 24 hours.

C. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material.

3.2 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
   a. Apply joint sealant to comply with manufacturer's written recommendations.

B. Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates

C. Broadcast: Immediately broadcast quartz silica aggregate into the primer using manufacturer's specially designed spray caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

D. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and top coating of cove base. Round internal and external corners. Refer to detail drawings.

E. Body coat: Mix base material according to manufacturer's recommended procedures. Uniformly spread mixed material over previously primed substrate using manufacturer's installation tool. Roll material with strict adherence to manufacturer's installation procedures and coverage rates.

F. Broadcast: Immediately broadcast decorative flakes into the body coat. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.

G. First Sealer: Remove excess un-bonded flakes by lightly brushing and vacuuming the floor surface. Mix and apply sealer with strict adherence to manufacturer's installation procedures.

H. Second sealer: Lightly sand first sealer coat. Mix and apply second sealer coat with strict adherence to manufacturer's installation procedures.

3.3 TERMINATIONS

A. Chase edges to “lock” the coating system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

D. Treat floor drains by chasing the coating to lock in place at point of termination.

3.4 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints to and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Vertical and horizontal contraction and expansion joints are treated by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.5 FIELD QUALITY CONTROL

A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.

1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTING, AND CURING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer. General Contractor is responsible for cleaning prior to inspection.

END OF SECTION 096723

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation of exterior substrates and application of the following:

1. Primers.
2. Water-based finish coatings.
3. Solvent-based finish coatings.
4. Floor sealers and paints.

B. Related Requirements:

1. Section 099123 "Interior Painting."

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include preparation requirements and application instructions.

B. Samples: For each type of topcoat product.

C. Samples for Initial Selection: For each type of topcoat product.

D. Samples for Verification: For each type of paint system and each color and gloss of topcoat. Submit actual paint drawdowns as specified below for verification Samples.

1. Submit Samples on rigid backing, **8 inches** square.
2. Apply coats on Samples in steps to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in applicable exterior painting schedule articles to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match paint products applied and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint Products: 5 percent, but not less than 1 gal. of each material and color

applied.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F**.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each paint product from single source from single manufacturer.

2.2 EXTERIOR PAINTS, GENERAL

A. Exterior Paints: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in product types below and applicable exterior painting schedule articles for the paint category indicated.

B. Material Compatibility:

1. Materials for use within each paint system must be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.
3. Flat Paints and Coatings: 50 g/L.
4. Nonflat Paints and Coatings: 50 g/L.
5. Dry-Fog Coatings: 150 g/L.
6. Primers, Sealers, and Undercoaters: 100 g/L.
7. Rust-Preventive Coatings: 100 g/L.
8. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
9. Pretreatment Wash Primers: 420 g/L.
10. Shellacs, Clear: 730 g/L.

11. Shellacs, Pigmented: 550 g/L.

C. Colors: As indicated in a color schedule on Drawings.

2.3 PRIMERS

A. Exterior Wood Preservative: Solvent-based, zinc or copper napthenate, penetrating antifungal treatment for exterior wood.

B. Water-Based Bonding Primer: Water-based-emulsion primer formulated to promote adhesion of subsequent specified coatings.

1. Basis-of-Design Product: Subject to compliance with requirements, provide S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, by Sherwin Williams or comparable product by one of the following:

a. Behr Paint Company (Behr Process LLC)
b. PPG Paints; PPG Industries, Inc.

C. Solvent-Based Bonding Primer: Solvent-based primer formulated to seal substrates and promote adhesion of specified subsequent coatings.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product by Sherwin Williams or comparable product by one of the following:

a. Benjamin Moore & Co.
b. PPG Paints; PPG Industries, Inc.

D. Water-Based, Galvanized-Metal Primer: Corrosion-resistant, pigmented, acrylic primer; formulated for use on cleaned/etched galvanized metal substrates to prepare it for subsequent water-based coatings.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product by Sherwin Williams or comparable product by one of the following:

a. Behr Paint Company (Behr Process LLC)
b. PPG Paints; PPG Industries, Inc.

2.4 WATER-BASED FINISH COATINGS

A. Exterior, Water-Based, Light Industrial Coating: Corrosion-resistant, water-based, pigmented, emulsion coating formulated for resistance to water, alkalis, moderate abrasion, and mild chemical exposure and for use on exterior substrates.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin Williams Company or comparable product by one of the following:

a. Behr Paint Company (Behr Process LLC)
b. PPG Paints; PPG Industries, Inc.

2. Gloss and Sheen Level: Manufacturer's standard semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.

D. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed substrates.

E. Canvas and Cotton Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

F. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION OF EXTERIOR PAINT PRODUCTS

A. Apply paints in accordance with manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in applicable exterior painting schedule articles may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting, Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:

a. Equipment, including panelboards and switch gear.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written instructions, apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.
3. Cost of retesting is Contractor's responsibility.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
3. Allow empty paint cans to dry before disposal.
4. Collect waste paint by type and deliver to recycling or collection facility.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE, METAL SUBSTRATES

A. Galvanized Metal Substrates:

1. Water-Based, Light Industrial Coating System: EP-1, EP-2, EP-3

a. Prime Coat: Water-based, galvanized-metal primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

B. Stainless Steel Substrates:

1. Water-Based, Light Industrial Coating System: <**EP-3**>

a. Prime Coat: Quick-dry aluminum primer.
b. Intermediate Coat: Matching topcoat.
c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

3.7 EXTERIOR PAINTING SCHEDULE, MISCELLANEOUS SUBSTRATES

A. Fiberglass Substrates:

1. Water-Based, Light Industrial Coating System:

a. Prime Coat: Solvent-based bonding primer.
b. Intermediate Coat: Matching topcoat.

c. Topcoat: Exterior, water-based, light industrial coating, semigloss.

END OF SECTION 09 91 13

SECTION 099123 – INTERIOR PAINT

GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on scheduled interior substrates.

1. Coating system materials, including sealers, primers, emulsions, enamels and other applied materials used as prime, intermediate and finish coats and the application of these materials.
2. Touch-up and finish painting of shop primed structural steel framing, steel decking, metal fabrications, including stairs and pipe railings and metal doors and frames.

B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect/Engineer will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Plastic laminate finish countertops and cabinets and solid surfacing.
b. Acoustical ceiling panels.
c. Metal toilet enclosures.
d. Metal lockers.
e. Finished mechanical and electrical equipment.
f. Light fixtures.
g. Switchgear.
h. Distribution cabinets.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Furred areas.
b. Ceiling plenums.
c. Pipe spaces.
d. Duct shafts.

3. Finished metal surfaces include the following:

    a. Anodized aluminum.
    b. Stainless steel.
    c. Chromium plate.
    d. Copper.
    e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

    a. Valve and damper operators.
    b. Linkages.
    c. Sensing devices.
    d. Motor and fan shafts.

5. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Requirements:

1. All Divisions.

1.2 DEFINITIONS

A. Gloss Levels:

1. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
2. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
3. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
4. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
5. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
6. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
7. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 SUBMITTALS

A. Product Data: Provide manufacturer’s color brochure and cut sheets for each type of product and each top-coat color indicated on the drawings. Include preparation requirements and application instructions.

B. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

A. Master Painters Institute (MPI) Standards:

1. Products: Comply with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and coating systems indicated.

B. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.

C. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened labeled packages and containers bearing manufacturer’s name and label, and the following information.

1. Product name or title of material.
2. Product description (generic classification or binder type.)
3. Manufacturer’s stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Store materials not in use in tightly covered containers in a single well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in a storage in a clean condition, free of foreign materials and residue.

C. Maintain paint material storage space clean, non-hazardous and orderly. Place waste and soiled paint rags in tightly covered metal containers; safely dispose of at end of each working day. Take every precaution to avoid fire hazards and spontaneous combustion. Provide acceptable type of fire extinguisher immediately adjacent to paint storage area.

1. Protect form freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 PROJECT CONDITIONS

A. Coordinate painting and finishing work with other trades to ensure adequate illumination, ventilation and dust-free environment during application and drying of paint and finish treatments.

B. Comply with material manufacturer's recommended temperature and environmental limitations for painting and finishing applications.

1. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
2. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and95 deg F (35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

D. Provide necessary protection, enclosures and temporary heat and ventilation during inclement weather to permit proper application and drying of paint coatings and finishing treatments.

1. Protect adjoining surfaces against damage or soiling.

E. Maintain uniform interior building temperature of minimum 65 degrees F. and humidity of 20%-40% for 24 hours before, during and continuously after painting.

F. Provide adequate ventilation as required for specified paint and finish treatment materials in spaces scheduled. Maintain for time periods recommended by material manufacturer to provide proper drying.

G. Provide adequate illumination on surfaces to be finished. Maintain a minimum 15 foot candle lighting level.

H. Maintain work in neat and orderly condition, promptly removing empty containers, wrappings, soiled rags, waste and rubbish from site.

1.7 MAINTENANCE MATERIALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Specifications are based on The Sherwin-Williams Co. products. Subject to compliance with the requirements, equal products by one of the scheduled manufacturers will be acceptable:

1. AkzoNobel Paints; Devoe High Performance Coatings, www.devoecoatings.com.
2. Benjamin Moore & Co.
3. PPG Architectural Finishes, Inc.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors:

1. P-1
   a. Manufacturer: Sherwin Williams
   b. Color: SW7008 Alabaster
   c. Finish: Eggshell
   d. General Paint
2. P-2
   a. Manufacturer: Sherwin Williams
   b. Color: SW7669 Summit Gray
   c. Finish: Semi-Gloss
   d. Door Trim
3. P-3
   a. Manufacturer: Sherwin Williams
   b. Color: SW9173 Shitake
   c. Finish: Eggshell
   d. Accent
4. P-4
   a. Manufacturer: Sherwin Williams
   b. Color: Match Igloo White
   c. Epoxy Paint
   d. Ceiling

2.3 PRIMERS/SEALERS

A. Gypsum Board Primer Sealer, Latex, Interior: MPI #50.

1. S-W: ProMar 200 Int Latex Primer B28W8200.

B. Wood/Plywood Primer Sealer, Latex, Interior: MPI #39.

1. S-W: PrepRite Multi-Purpose Latex Primer B51W8020.

C. Ferrous Metal Primer, Alkyd, Quick Dry, for Metal: MPI #76.

1. S-W: Kem Kromik Metal Primer B50N2/B60W1

D. Galvanized Metal Primer, Water Based: MPI #134.]

1. S-W: Galvite B50W3.

2.4 UNDERCOAT MATERIALS

A. Alkyd Interior Enamel Undercoat (Gloss Level 5): MPI #46.

1. S-W: ProMar 200 Alkyd Semi-Gloss Enamel B34W200.

2.5 FINISH MATERIALS

A. Egg-Shell, Latex, (Gloss Level 2: MPI #44

1. S-W: ProMar 200 Interior Latex Eg-Shel B20W225.

B. Semi-Gloss, Latex: (Gloss Level 4). MPI #43.

1. S-W: ProMar 200 Interior Latex Semi-Gloss B31W02251.

C. Gloss, Alkyd; (Gloss Level 6). MPI #48

1. S-W: ProMar 200 Interior Alkyd Gloss Enamel B35 Series.

D. Deep-Color, Alkyd Resin Trim Paint: Deep-color, ready-mixed alkyd paint.

1. S-W: SWP Exterior Gloss Finish A-2 Series.

E. Dry Fall, Latex, Flat: MPI #118

1. S-W: Industrial & Marine Prodry Acrylic Dryfall B75WF1200.

2.6 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (Clay and CMU): 12 percent.
3. Wood: 15 percent.
4. Gypsum Board: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

E. Notify the A/E about anticipated problems using the materials specified over substrates primed by others

F. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

G. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
2. Provide barrier coats over incompatible primers or remove and reprime. Notify A/E in writing about anticipated problems using the specified finish-coat material with substrates primed by others.

D. Gypsum board: Remove dust, dirt, loose and other foreign material. Fill hairline cracks, holes and other defects with filler compatible with finish treatment. Sand smooth.

E. Wood and Plywood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

1. Scrape and clean small, dry, seasoned knots with a recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with filler compatible with finish treatment. Sand smooth when dried.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Interior Steel Man Doors.

1. Field prime and seal all steel doors as recommended by the door manufacturer prior to any finish painting.
2. Finish paint bottom edges of all steel doors before they are hung.

J. Carefully mix and prepare paint materials according to manufacturer's directions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer and only within recommended limits.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Application Equipment

1. Brushes: Use brushes best suited for the material applied.
2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

E. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

F. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms, including but not limited to:

a. Uninsulated metal piping.
b. Uninsulated plastic piping.
c. Pipe hangers and supports.
d. Metal conduit.
e. Plastic conduit.
f. Tanks that do not have factory-applied final finishes.
g. Duct, equipment, and pipe insulation covering or other paintable jacket material.
h. Other items as directed by A/E

2. Paint the following work where exposed in occupied spaces, including but not limited to:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
h. Other items as directed by A/E.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.
4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only
5. Finish exterior doors on tops, bottoms, and side edges same as exterior faces
6. Sand lightly between each succeeding enamel coat
7. Omit primer on metal surfaces that have been shop-primed and touch-up painted

G. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

H. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

A. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer

B. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by A/E, and leave in an undamaged condition.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 INTERIOR PAINTING SCHEDULE

A. Coordinate Interior Painting work with Section OM 09 96 00 High-Performance Coatings.

1. In general, High Performance Coatings are required in the interior Truck Garage and Mezzanine up to a line 8’-0” above the finished floor. Items above the 8’-0” line are to receive Alkyd Enamel finish:
2. All concrete masonry units (CMU) are to receive High Performance Coatings

B. Coordinate Parts and Oil Rooms floor finishes with Section OM 09 97 00 Epoxy Flooring.

C. Refer to interior drawings & room finish schedule for location and coating type.

D. Gypsum Board Substrates:

1. Egg-Shell latex finish: 2 finish coats over primer with total dry film thickness not less 4.4 mils.

E. Ferrous Metal Substrates:

1. Metal doors and frames: Semi-Gloss latex finish: 2 finish coats over primer with total dry film thickness not less than 5.1 mils
2. Exposed metal decking: Water-Based Dry-Fall System: 2 finish coats over shop primer with total dry film thickness not less than 5.5 mils.

    a. Prime Coat: Shop primer specified in Division OM 05 Section where substrate is specified.

3. Gloss alkyd finish: 2 finish coats over primer with total dry film thickness not less than 7.5 mils.

    a. Prime Coat: Shop primer specified in Division 05 Section where substrate is specified.

F. Zinc-Coated Metal Substrates:

1. Gloss alkyd finish: 2 finish coats with total dry film thickness not less than 5.0 mils.

G. Wood and Plywood Substrates, opaque painted finish:

1. Semi-Gloss latex finish: 2 finish coats over primer with total dry film thickness not less than 4.2 mils

H. Cotton or Canvas Insulation-Covering Substrates:

1. Flat Latex Emulsion Size: Two coats. Add fungicidal agent to render fabric mildewproof.
2. First and Second Coats: Interior, flat, latex-based paint

3.8 ACCENT COLORS

A. Provide deep tone accent colors selected for interior locations shown on plan or scheduled.

END OF SECTION 099123

SECTION 101100 – VISUAL DISPLAY SURFACES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Markerboards.

2. Display Case

B. Related Sections:

1. Division 06 "Rough Carpentry".
2. Division 10 "Display Cases"

1.3 DEFINITIONS

A. Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; include markerboards.

B. Visual Display Surface: Surfaces that are used to convey information visually, including surfaces of markerboards.

1.4 ACTION SUBMITTALS

A. Product Data: Provide manufacturer’s product color brochure and literature for review. Clearly mark size, material and finish for boards.

1.5 INFORMATIONAL SUBMITTALS

A. Warranties: Sample of standard warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For visual display surfaces to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.
3. Become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store visual display surfaces vertically with packing materials between each unit.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify actual location of the display case and ensure provision of adequate blocking the wall.

1.10 MARKER BOARD WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Surfaces lose original writing and erasing qualities.
b. Surfaces exhibit crazing, cracking, or flaking.

2. Warranty Period: 50 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. MB-1, MB-2, BD-1

B. Porcelain-Enamel Face Sheet: ASTM A 424, enameling-grade steel, uncoated thickness indicated; with exposed face and edges coated with primer, 1.7-to-2.5-mil- (0.043-to-0.064-mm-) thick ground coat, and color cover coat; and with concealed face coated with primer and 1.7-to-2.5-mil- (0.043-to-0.064-mm-) thick ground coat.

C. Melamine: Thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

D. High-Pressure Plastic Laminate: NEMA LD 3.

E. Hardboard: ANSI A135.4, tempered.

F. Particleboard: ANSI A208.1, Grade M-1

G. Adhesives: Manufacturer's standard product.

2.2 MARKERBOARD ASSEMBLIES

A. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 0.021-inch- (0.53-mm-) thick, porcelain-enamel face sheet with high-gloss finish.

1. Manufacturers: Subject to compliance with requirements, provide products indicated on Drawings or comparable product by one of the following:

    a. Claridge Products and Equipment, Inc.
    b. Egan Visual Inc.
    c. Marsh Industries, Inc.; Visual Products Group.

2. Fiberboard Core: 3/8 inch (9.5 mm) thick; with 0.015-inch- (0.38-mm-) thick, aluminum sheet backing.
3. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
4. MB-1
    a. Manufacturer: GHENT
    b. Name: M1 Series Aluminum Framed Porcelain Marker Board
    c. Size: 48.47 W x 48.47 H Inches
    d. Thickness: 3/8-inch (9.5 mm).
    e. Color: Whiteboard, Steel Laminated.
5. MB-2
    a. Manufacturer: GHENT
    b. Name: M1 Series Aluminum Framed Porcelain Marker Board
    c. Size: 144.59 W x 48.47 H Inches
    d. Thickness: 3/8-inch (9.5 mm).
    e. Color: Whiteboard, Steel Laminated.

2.3 MARKERBOARD ACCESSORIES

A. Aluminum Frames Fabricated from not less than 0.062-inch- (1.57-mm-) thick, extruded aluminum; of size and shape indicated.

1. Factory-Applied Trim: Manufacturer's standard.

B. Chalktray: Manufacturer's standard, continuous.

1. Box Type: Extruded aluminum with slanted front, grooved tray, and cast-aluminum end closures.

C. Provide 2 sets of markers and erasers for each marker board.

2.4 DISPLAY CASE BULLETIN BOARD

A. Basis-of-Design Product: Prefabricated, bulletin display case, fiber board, silver aluminum frame. Enclosed-double door.

1. BD-1
   a. Manufacturer: WORKPRO
   b. Name: Enclosed Bulletin Board
   c. Size: 48 W x 36 H Inches.
   d. Color: Natural Cork

2.5 FABRICATION

A. Porcelain-Enamel Visual Display Assemblies: Laminate porcelain-enamel face sheet and backing sheet to core material under heat and pressure with manufacturer's standard flexible, waterproof adhesive.

B. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.

1. Where factory-applied trim is indicated, trim shall be assembled and attached to visual display units at manufacturer's factory before shipment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine walls and partitions for proper preparation and backing for visual display surfaces.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.

3.3 INSTALLATION, GENERAL

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings. Keep perimeter lines straight, level, and plumb. Provide clips, trim, and/or accessories necessary for complete installation. As much as possible screw anchor surfaces directly into wall studs. Minimize use of toggles.

3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

A. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with screw anchors. Secure both top and bottom of boards to wall studs.

1. Field-Applied Aluminum Trim: Attach trim over edges of visual display boards and conceal grounds and clips. Attach trim to boards with fasteners at not more than 24 inches (610 mm) o.c.

a. If chalk trays are provided, attach to boards with fasteners at not more than 12 inches (300 mm) o.c.

3.5 CLEANING AND PROTECTION

A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 101100

SECTION 101423.16 - ROOM-IDENTIFICATION PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Panel signs
   2. Door number tags

B. Related Sections include the following:

   1. Division 01 "Temporary Facilities and Controls"

1.3 DEFINITIONS

A. ADA ("Americans with Disabilities Act) criteria is to be found in the 2009 International Code Council A117.1.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For room-identification signs.

   1. Include fabrication and installation details and attachments to other work.
   2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
   3. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

C. Samples: For each exposed product and for each color and texture specified.Sign Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 WARRANTY

1.8 Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1.9 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in service performance.

B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

C. Regulatory Requirements: Comply with applicable provisions for handicap accessibility in the 2009 International Code Council A117.1.

1.10 COORDINATION

A. Coordinate placement of anchorage devices with templates for installing signs.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 INTERIOR PANEL SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ACE Sign Systems, Inc.
2. APCO Graphics, Inc.
3. ASI-Modulex, Inc.
4. Best Sign Systems Inc.
5. Columbus Graphics Incorporated
6. Interior Graphics Systems
7. Matthews International Corporation; Bronze Division.
8. Mills Manufacturing Company.

9. Mohawk Sign Systems.
10. Nelson-Harkins Industries.
11. Signature Signs, Incorporated.

B. Interior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:

1. Acrylic Sheet: 0.060 inch (1.52 mm) thick.
2. Edge Condition: Square cut.
3. Corner Condition: Rounded to radius indicated.
4. Mounting: Framed.

    a. Wall mounted with concealed anchors.
    b. Manufacturer's standard anchors for substrates encountered.

5. Color: Provide Color Brochure.
6. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.

C. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

1. Panel Material: Clear acrylic sheet with opaque color coating, subsurface applied.
2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).

D. Door Number Tag: Provide a 1” x 2” aluminum tag with the door number stamped or etched on the face. Mount the tag above the middle hinge on the edge of the door.

2.3 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Furnish anchors, as required, to be set into substrate.

2.4 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated on drawings.

1. Mill joints to tight, hairline fit.
2. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
3. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are not acceptable. Noticeable variations in the same piece are not acceptable.

2.6 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy background and frame colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Verify that items, including anchor inserts, are sized and located to accommodate signs.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.

B. Comply with sign manufacturer's written instructions except where more stringent requirements apply.

1. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

2. Signs Mounted on Glass: Provide matching opaque plate on opposite side of glass to conceal mounting materials.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 101400

SECTION 10 21 13.19 - PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-plastic toilet compartments.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for supports that attach floor-and-ceiling-anchored compartments to overhead structural system.
2. Section 061000 "Rough Carpentry" for blocking.
3. Section 092216 "Non-Structural Metal Framing" for blocking.
4. Section 102800 "Toilet, Bath, and Laundry Accessories" for accessories mounted on toilet compartments.

1.2 COORDINATION

A. Coordinate requirements for overhead supports,blocking, reinforcing, and other supports concealed within wall and ceiling to ensure that toilet compartments can be supported and installed as indicated.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Solid-plastic toilet compartments:

a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachment details.
2. Show locations of cutouts for compartment-mounted toilet accessories.
3. Show locations of centerlines of toilet fixtures.
4. Show locations of floor drains.
5. Show ceiling grid, ceiling-mounted items, and overhead support or bracing locations.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of toilet compartment.

1. Include Samples of hardware and accessories involving material and color

selection.

D. Samples for Verification: Actual sample of finished products for each type of toilet compartment, hardware, and accessory.

1. Size: Manufacturer's standard size.

E. Delegated Design Submittals: For grab bars mounted on toilet compartment panels, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Include structural design calculations indicating compliance with specified structural-performance requirements.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For toilet compartments.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Materials: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Door Hinges: hinge(s) with associated fasteners.
2. Latch and Keeper: One latch(es) and keeper(s) with associated fasteners.
3. Door Bumper: One bumper(s) with associated fasteners.
4. Door Pull: One door pull(s) with associated fasteners.
5. Fasteners: 10 fasteners of each size and type.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements, and coordinate before fabrication.

1.7 Quality Assurance

A. Comply with requirements in GSA's CID-A-A-60003, "Partitions, Toilets, Complete."Insert your Paragraph.

B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities for toilet compartments designated as accessible.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain plastic toilet compartments from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire Performance: Tested in accordance with, and pass the acceptance criteria of, NFPA 286.

B. Structural Performance: Where grab bars are mounted on toilet compartments, design panels to comply with the following requirements:

1. Panels are able to withstand a concentrated load on grab bar of at least **250 lbf** applied at any direction and at any point, without deformation of panel.

C. Regulatory Requirements: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for toilet compartments designated as accessible.

2.3 SOLID-PLASTIC TOILET COMPARTMENTS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Bradley Corporation; Mills Partitions or comparable product by one of the following:

1. ASI Accurate Partitions
2. Hadrian Inc.; Zurn Industries, LLC
3. Scranton Products

B. Toilet-Enclosure Style: Overhead braced Floor anchored.

C. Urinal-Screen Style: Wall hung.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) material, not less than **1 inch** thick, seamless, with eased edges, and with homogenous color throughout thickness of material. Provide with no-sightline system consisting of door and pilaster lapped edges on strike side of door and door and pilaster lapped edges on hinge side of door (unless continuous hinge is used).

1. Integral Hinges: Configure doors and pilasters to receive integral hinges.
2. Heat-Sink Strip: Manufacturer's continuous, stainless steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious

combustion.

3. Color: One color in each room as selected by Architect from manufacturer's full range.

E. Urinal-Screen Construction: Matching panel construction.

F. Pilaster Shoes: Manufacturer's standard design; solid plastic stainless steel.

1. Plastic Color: Matching pilaster.

G. Brackets (Fittings):

1. Full-Height (Continuous) Type: Manufacturer's standard design; solid plastic or extruded aluminum.

a. Plastic Color: Matching panel.

H. Overhead Cross Bracing for Ceiling-Hung Units: As recommended by manufacturer and fabricated from solid plastic.

2.4 HARDWARE AND ACCESSORIES

A. Door Hardware and Accessories: Manufacturer's operating hardware and accessories.

1. Hinges:

a. Manufacturer's standard hinge; self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees, allowing emergency access by lifting door.

2. Latch and Keeper: Manufacturer's surface-mounted latch unit, designed for emergency access, and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at toilet enclosures designated as accessible.

a. Material: Manufacturer's standard.

3. Coat Hook: Manufacturer's combination hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories.

a. Material: Manufacturer's standard.

4. Door Bumper: Manufacturer's rubber-tipped bumper at outswinging doors.

a. Material: Manufacturer's standard.

5. Door Pull: Manufacturer's unit at outswinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at toilet enclosures designated as accessible.

a. Material: Manufacturer's standard.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.5 MATERIALS

A. Aluminum Castings: ASTM B26/B26M.

B. Aluminum Extrusions: **ASTM B221**.

C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

D. Stainless Steel Castings: ASTM A743/A743M.

E. Zamac: ASTM B86, commercial zinc-alloy die castings.

2.6 FABRICATION

A. Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Overhead-Braced Units: Manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters and walls to suit floor and wall conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Floor-Anchored Units: Manufacturer's standard corrosion-resistant anchoring assemblies at pilasters and walls, with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

D. Door Size and Swings: Unless otherwise indicated, provide **24-inch-** wide, inswinging doors for standard toilet enclosures and **36-inch-** wide, outswinging doors with a minimum **32-inch-** wide, clear opening for toilet enclosures designated as accessible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.

1. Confirm location and adequacy of blocking and supports required for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

1. Maximum Clearances:

a. Pilasters and Panels or Screens: **1/2 inch**.
b. Panels or Screens and Walls: **1 inch**.

B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than **1-3/4 inches** into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels and adjust, so tops of doors are parallel with overhead brace when doors are in closed position.

C. Floor-Anchored Units: Set pilasters with anchors penetrating not less than **2 inches** into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust, so tops of doors are level with tops of pilasters when doors are in closed position.

D. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

3.3 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware in accordance with hardware manufacturer's written instructions for proper operation. Set hinges on inswinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors to return doors to fully closed position.

END OF SECTION 10 21 13.19

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Private-use bathroom accessories.
3. Underlavatory guards.
4. Custodial accessories.

B. Related Requirements:

1. Section 093013 "Ceramic Tiling" for ceramic toilet and bath accessories.

1.2 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.3 ACTION SUBMITTALS

A. Product Data: For each product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify accessories using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

A. Owner-Furnished Materials: Soap Dispenser, Toilet Paper Dispenser, Roll Towel Dispenser.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design accessories and fasteners to comply with the following requirements:

1. Grab Bars: Installed units are able to resist **250 lbf** concentrated load applied in any direction and at any point.

2.3 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

B. Waste Receptacle:

1. Basis-of-Design Product: Subject to compliance with requirements, provide B-43644 , by Bobrick Washroom Equipment, Inc or comparable product by one of the following:

a. ASI-American Specialties, Inc.

2. Mounting: Open top, recessed Wall mounted for corner installation.
3. Minimum Capacity: 12.8 gal.
4. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
5. Liner: Reusable vinyl liner.
6. Lockset: None. Unit must have Non-Locking compartment for waste receptacle.

C. Grab Bar:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick B-6806 x 36; Bobrick B-6806 x 42, & B-6861, by Bobrick Washroom Equipment, Inc. or comparable product by one of the following:

    a. ASI-American Specialties, Inc.

2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, **0.05 inch** thick.

    a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. OD: 1-1/2 inches. Comply with ADA guidelines.
5. Configuration and Length: As indicated on Drawings. Comply with ADA guidelines

D. Sanitary-Napkin Disposal Unit:

1. Basis-of-Design Product: Subject to compliance with requirements, provide B-270, by Bobrick Washroom Equipment, Inc. or comparable product by one of the following:

    a. ASI-American Specialties, Inc.

2. Mounting: Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

E. Seat-Cover Dispenser:

1. Basis-of-Design Product: Subject to compliance with requirements, provide B-221, by Bobrick Washroom Equipment, Inc. or comparable product by one of the following:

    a. ASI-American Specialties, Inc.

2. Mounting: Surface mounted.
3. Minimum Capacity: 250 seat covers.
4. Exposed Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
5. Lockset: Tumbler type.

F. Mirror Unit:

1. Basis-of-Design Product: Subject to compliance with requirements, provide B-290, by Bobrick Washroom Equipment, Inc. or comparable product by one of the following:

    a. ASI-American Specialties, Inc.

2. Frame: Stainless steel angle, 0.05 inch thick.

a. Corners: Welded and ground smooth.

3. Size: As indicated on Drawings.
4. Hangers: Manufacturer's standard rigid, tamper and theft resistant.

2.4 UNDERLAVATORY GUARDS

A. Underlavatory Guard:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Plumberex Specialty Products, Inc.
b. Truebro; IPS Corporation

2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.5 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Custodial Mop and Broom Holder:

1. Basis-of-Design Product: Subject to compliance with requirements, provide B-224, by Bobrick Washroom Equipment, Inc. or comparable product by one of the following:

a. ASI-American Specialties, Inc.

2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 inches.
4. Hooks: Three.
5. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

a. Shelf: Not less than nominal **0.05-inch-** thick stainless steel.
b. Rod: Approximately **1/4-inch-** diameter stainless steel.

2.6 MATERIALS

A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, **0.031-inch-** minimum nominal thickness unless otherwise indicated.

B. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), **0.036-inch-** minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A653/A653M, with **G60** hot-dip zinc coating.

D. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

F. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).

G. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.7 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION OF TOILET, BATH, AND LAUNDRY ACCESSORIES

A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

1. Remove temporary labels and protective coatings.

B. Grab Bars: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 10 28 00

SECTION 10 44 13 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:
2. Fire-protection cabinets for the following:

    a. Portable fire extinguisher.

B. Related Requirements:

1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.

B. Shop Drawings: For fire-protection cabinets.

1. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain fire-protection cabinets, accessories, and fire extinguishers from single source from single manufacturer.

2.2 FIRE-PROTECTION CABINET

A. Basis-of-Design Product: Subject to compliance with requirements, provide Larsens Manufacturing Company, Architectural Series 2409-R3 or comparable product by one of the following:

1. Croker; a Division of Morris Group International
2. Guardian Fire Equipment, Inc
3. JL Industries; Activar Construction Products Group, Inc.
4. Nystrom, Inc.
5. Potter Roemer LLC; a Division of Morris Group International

B. Fire-Protection Cabinet Type: Suitable for fire extinguisher.

C. Cabinet Construction: Nonrated.

D. Cabinet Material: Cold-rolled steel sheet.

E. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).

1. Rolled-Edge Trim: 2-1/2-inch backbend depth.

F. Cabinet Trim Material: Steel sheet.

G. Door Material: Steel sheet.

H. Door Style: Vertical duo panel with frame.

I. Door Glazing: Acrylic sheet.

1. Acrylic Sheet Color:

a. Clear transparent acrylic sheet.

J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide recessed door pull and friction latch.
2. Provide continuous hinge, of same material and finish as trim,, permitting door to open 180 degrees.

K. Accessories:

1. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.

    a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."

        1) Location: Applied to cabinet door.
        2) Application Process: Decals.
        3) Lettering Color: Black.
        4) Orientation: Vertical.

L. Materials:

1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.

    a. Finish: Baked enamel, TGIC polyester powder coat, HAA polyester powder coat, epoxy powder coat, or polyester/epoxy hybrid powder coat, complying with AAMA 2603.
    b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    c. Color: White.

2. Transparent Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), 1.5 mm thick, with Finish 1 (smooth or polished).

2.3 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum **1/2 inch** thick.
2. Miter and weld perimeter door frames and grind smooth.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION OF FIRE-PROTECTION CABINETS

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at height indicated below:

1. Fire-Protection Cabinet Mounting Height: 42 inches above finished floor to top of fire extinguisher.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

C. Identification:

1. Apply decals at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 44 13

SECTION 10 44 16 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Requirements:

1. Section 104413 "Fire Protection Cabinets."

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function.

1.3 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.5 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Croker; a Division of Morris Group International
b. Guardian Fire Equipment, Inc
c. JL Industries; Activar Construction Products Group, Inc.
d. Larsen's Manufacturing Company
e. Nystrom, Inc.
f. Potter Roemer LLC; a Division of Morris Group International

2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
3. Valves: Manufacturer's standard.
4. Handles and Levers: Manufacturer's standard.
5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type in Steel Container E-FE2: UL-rated 10-A:120-B:C, 20-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

C. Multipurpose Dry-Chemical Type in Aluminum Container E-FE1: UL-rated 2-A:10-B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-aluminum container.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish. Use manufacturer's standard stainless steel mounting brackets in wash bay locations.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Croker; a Division of Morris Group International
b. Guardian Fire Equipment, Inc
c. JL Industries; Activar Construction Products Group, Inc.
d. Larsen's Manufacturing Company
e. Nystrom, Inc.
f. Potter Roemer LLC; a Division of Morris Group International

2. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

1. Mounting Height: Top of fire extinguisher to be at 42 inches above finished floor.

END OF SECTION 10 44 16

SECTION 105113 – METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard metal lockers.

1.3 ACTION SUBMITTALS

A. Product Data: Provide manufacturer's color brochure and/or color cut sheets for each type of product indicated in this section. Indicate with a mark which product is to be provided. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.

B. Shop Drawings: For metal lockers.

1. Include plans, elevations, sections, details, and attachments details.
2. Show locker trim and accessories and sloped tops.
3. Provide numbering system according to sequence provided by Owner.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Full-size units of the following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than five units:

    a. Locks.
    b. Identification plates.
    c. Hooks.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Authorized distributor and installer.

B. Source Limitations: Obtain metal lockers and accessories from single source from single manufacturer.

C. Comply with applicable provisions for handicap accessibility in the 2009 International Code Council A117.1.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.9 COORDINATION

A. Coordinate sizes and locations of bases for metal lockers.

B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, including finish, within the manufacture’s specified warranty period for the atmospheric environment in which the lockers will be located.

1. Failures include the following:

    a. Structural failures.
    b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded. Damage/corrosion affects from extended periods of exposure to salty environment is excluded.

3. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 zinc-iron, alloy (galvannealed) coating designation.

C. Stainless-Steel Sheet: ASTM A 666, Type 304.

D. Extruded Aluminum: ASTM B 221, alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated.

E. Steel Tube: ASTM A 500, cold rolled.

F. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.

G. Anchors: Material, type, and size required for secure anchorage to each substrate.

1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and all other locations for corrosion resistance.
2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.2 STANDARD METAL LOCKERS

A. Products: Subject to compliance with requirements, provide one of the following:

1. Art Metal Products; Standard K.D. Lockers.
2. Lyon Workspace Products, LLC; Standard Lockers.
3. Republic Storage Systems Company; Standard Lockers.
4. Shanahan's Manufacturing Limited; Deluxe Series Lockers.
5. Tennsco Corp.; Tennsco Lockers.
6. Penco Products – Metal Lockers

B. Locker Arrangement: Single tier.

1. Garage lockers 21”w x 24”d x 72” high with legs. Ability to be attached to each other side-by-side in sets of 3’s or 4’s. See Truck Storage floor plan.

C. Material: Cold-rolled steel sheet.

D. Body: Assembled by riveting or bolting body components together. Fabricate from unperforated steel sheet as follows:

1. Tops, Bottoms, and Intermediate Dividers: 0.024-inch (0.61-mm) nominal thickness, with single bend at sides.
2. Backs and Sides: 0.024-inch (0.61-mm) nominal thickness, with full-height, double flanged connections.
3. Shelves: 0.024-inch (0.61-mm) nominal thickness, with double bend at front and single bend at sides and back.
4. Slope tops.

E. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.

1. Cross Frames between Tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.
2. Frame Vents: Fabricate face frames with vents.

F. Doors: One piece; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.

1. Doors less than 12 inches (305 mm) wide may be fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
2. Doors for box lockers less than 15 inches (381 mm) wide may be fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
3. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
4. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet; welded to inner face of doors.
5. Door Style: Vented panel as follows:

    a. Louvered Vents: No fewer than six louver openings at top and bottom for single tier lockers.

G. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees; self-closing.

1. Knuckle Hinges: Steel, full loop, five or seven knuckles, tight pin; minimum 2 inches (51 mm) high. Provide no fewer than three hinges for each door more than 42 inches (1067 mm) high.
2. Continuous Hinges: Manufacturer's standard, steel, full height.

H. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond face of door; pry and vandal resistant.

1. Multipoint Latching: Finger-lift latch control designed for use with built-in combination locks, built-in key locks, or padlocks; positive automatic latching and prelocking.

a. Latch Hooks: Equip doors 48 inches (1219 mm) and higher with three latch hooks fabricated from 0.105-inch (2.66-mm) nominal-thickness steel sheet; welded or riveted to full-height door strikes; with resilient silencer on each latch hook.
b. Latching Mechanism: Manufacturer's standard, rattle-free latching mechanism and moving components isolated with vinyl to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

I. Combination Padlocks: Provided by Owner.

J. Equipment: Equip each metal locker with identification plate and the following unless otherwise indicated:

1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.

K. Accessories:

1. Legs: 6 inches (152 mm) high; formed by extending vertical frame members, or fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; welded to bottom of locker.

a. Closed Front and End Bases: Fabricated from 0.036-inch (0.91-mm) nominal thickness steel sheet.

2. Finished End Panels: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.
3. Center Dividers: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.
4. Continuous sloped metal tops: Fabricated from 0.024 inch (0.61mm) nominal thickness steel sheet.

L. Finish: Baked enamel.

1. Color: Selected from manufacturer’s standard full range of colors.

2.3 FABRICATION

A. Fabricate metal lockers square, rigid, and without warp and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.

B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.

C. Knocked-Down Construction: Fabricate metal lockers using nuts, bolts, screws, or rivets for nominal assembly at Project site.

D. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.

E. Finished Side Panels: All lockers shall have finished sides.

F. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install level, plumb, and true; make level as required with permanent non-corrosive shims. No wood shims allowed.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
2. Anchor single rows of metal lockers to walls near top and bottom of lockers.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.

C. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 10 75 16 - GROUND-SET FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes ground-set flagpoles made from aluminum.

B. Owner-Furnished Material: Flags.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For each flagpole.

1. Include the following

a. Plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
b. Section, and details of foundation system.

C. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain flagpoles as complete units, including fittings, accessories, bases, and

anchorage devices, from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Flagpole assemblies to withstand the effects of earthquake motions determined according to local requirements.

B. Structural Performance: Flagpole assemblies, including anchorages and supports, to withstand design loads indicated within limits and under conditions indicated.

1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 90 MPH (40m/s); 3-second gust speed at 33 feet (10m) above ground.
2. Base flagpole design on nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

2.3 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B241/B241M, Alloy 6063, with a minimum wall thickness of **1/2 inch**.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Flagpole
b. Baartol Company
c. Eder Flag Manufacturing Company, Inc
d. Morgan-Francis Flagpoles and Accessories
e. Pole-Tech Co., Inc.
f. US Flag & Flagpole Supply, LLC

B. Exposed Height: 40 feet.

C. Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

1. Fabricate shop and field joints without using fasteners, screw collars, or lead calking.
2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, **0.064-inch** wall thickness with **1/2-inch** steel bottom plate and support plate; **3/4-inch-** diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

1. Flashing Collar: Same material and finish as flagpole.

2.4 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. **0.063-inch** spun aluminum, finished to match flagpole.

B. External Halyard: Ball-bearing, nonfouling, revolving truck assembly of cast metal with continuous 5/16-inch- diameter, braided polypropylene halyard and **9-inch** cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.

1. Halyards and Cleats: One at each flagpole.
2. Cleat Covers: Cast metal, finished to match flagpole, secured with cylinder locks.
3. Halyard Covers: **2-inch** channel, **60 inches** long, finished to match flagpole.
4. Halyard Flag Snaps: Stainless steel swivel snap hooks. Furnish two per halyard.

2.5 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

C. Sand: ASTM C33/C33M, fine aggregate.

D. Elastomeric Joint Sealant: Multicomponent nonsag urethane joint sealant complying with requirements in Section 079200 "Joint Sealants."

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.6 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during

concreting.

D. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

E. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

F. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a **2-inch** layer of elastomeric joint sealant and cover with flashing collar.

C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

END OF SECTION 10 75 16

SECTION 11 11 00 - VEHICLE SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. Types of garage equipment work in this section includes:

1. Portable welding curtains
2. Lubrication equipment and Tanks
3. Work Benches
4. Metal shelving
5. Metal bin units
6. Trench Drains and Catch Basins
7. Water Reel Systems

PART 2 - PRODUCTS

2.1 PORTABLE WELDING CURTAIN

A. Provide portable, two-panel opaque canvas welding curtain and support unit. Each panel shall be 6' high by 4' wide.

B. Manufacturers:

1. Frommelt Model SV64DG2.
2. Steiner Model STE 50146 with STE 54202.
3. Wilson Model No. R2064-15.

2.2 LUBRICATION EQUIPMENT

A. Manufacturers:

1. All like components within a fluid system such as pump and pump controls, reels, hoses, valves, connectors, volume meters, etc., shall be the products of a single manufacturer.
2. Coordinate the material types (motor oil(s), hydraulic oil(s), future oil(s), grease, and air), quantities, and final labeling of each lube and service reel with the Owner during design.
3. The contractor to furnish materials and equipment necessary to install, test and make ready for operation a fluid dispense system as specified here in, as manufactured by Graco Inc. (Basis of Design) or approved equal by ARO, Lincoln-Pentair, or Balcrank.

B. Materials:

1. HYDRAULIC AND MOTOR OIL PUMP SYSTEMS

    a. Lubricant pumps to utilize 275 Gallon Tank systems and to include:
    b. Fireball 300 Universal Pump (Graco #203876)

        1) Graco Fireball 300 universal length pump for bulk tank mounting, 5:1 ratio, pneumatically operated, double-ball and double acting pump. Air motor diameter is 3” (7.6 cm) with a 3” (7.6 cm) stroke. The air motor, air motor valves and lower pump are to be of the “in-line” design. The normal air requirements are 40-180 psi (2.8-12.5 bar) with air consumption of 18 scfm @100 psi (7 bar). Pump to be mounted on the 275-Gal Tank utilizing the thermal relief kit fittings and a suction tube.
        2) Pump ratio:5:1
        3) Continuous duty flow rate:3 GPM
        4) Maximum fluid pressure:900 PSI
        5) Maximum air inlet pressure:180 PSI
        6) Fluid outlet size:1/2” NPT
        7) Air inlet size: 3/8" NPT

    c. The following accessories are to be installed at each pump

        1) Thermal Relief Assembly: Graco #237893
        2) Filter/Regulator/Lubricator: Graco #110150
        3) Bleed-Type Air Shut-Off Valve: Graco #110225
        4) Fluid Shut-Off Valve: Graco #108458
        5) Hose and Fitting Kit: Graco #222063
        6) Suction Tube: Provided by installer

2. BULK LUBRICATION STORAGE TANKS

    a. The bulk tank shall be 275 gallon vertical, stand-on-end, double walled tank with 110 percent capacity which can be used for new lubrication products, as well as used oil. The tanks dimensions are to be 48 inches long x 30 inches wide x 68 inches high plus or minus as specified here in, as manufactured by Modern Weld Company. (Basis of Design) or approved equal by, Hamilton Tanks Inc. and Highland Tanks.
    b. Tanks are to be designed, constructed, and tested in accordance with Underwriters Laboratories, Inc. Standard 142. “UL 142” pertains to Steel Aboveground Tanks for Flammable and Combustible Liquids. Tanks shall, with this listing, meet the requirements for atmospheric tanks of The National Fire Protection Association (NFPA) Sections 30, 30A, and 31.

        1) Each primary tank shall have one emergency vent fitting as required by UL and four additional fittings for the mounting and installation of equipment.
        2) Each secondary tank (double wall design) shall have one emergency vent fitting as required by UL and one additional fitting for interstitial monitoring and venting.
        3) Each tank shall be equipped with lifting lugs.

c. Primary Storage Tank

1) Primary tank will be of rectangular design.
2) Primary wall tank shall be constructed of ASTM A-1011 / A1011M or A-36 carbon steel, ASTM A-240 type, typical for oils.
3) Primary tank used for the storage of antifreeze or other corrosive materials are to be constructed of 304, 316 stainless steel, as required regarding product compatibility.
4) Primary tank shall be factory pressure tested per UL 142 specification at 3 psi.

d. Secondary Containment Tank

1) Each secondary containment tank will be of rectangular design.
2) Each secondary containment tank shall be listed by Underwriters Laboratories as a secondary containment tank.
3) Each secondary containment tank shall be constructed of ASTM A-1011/A- 1011M or ASTM A-240 type steel.
4) Each secondary containment tank shall be factory pressure tested per UL 142 specifications at 3 psi.
5) Each secondary containment tank exterior shall have one coat of red oxide primer.

e. Tank Openings: provide five openings in the top of the primary tanks: 2 – 4 inch and 3 – 2 inch openings with female treads.

1) Vent
2) Emergency vent
3) Fill
4) Pump opening
5) Tank gauge
6) Provide a sight glass in outer wall for observing oil leakage from inner tank.

3. USED OIL PUMP SYSTEM

a. Used Oil Pump System – Graco #24E199
b. The 1:1 ratio positive displacement pump shall have a pneumatically operated 1” body design, the Husky 1050 diaphragm pump to be aluminum with stainless steel trim and interior components. The pump to be of double diaphragm design and have a maximum suction lift of 25 feet wet and 16 feet dry. The air motor is to have an external muffler that operates below OSHA noise standards, and be equipped with a grounding lug. Husky 1050 diaphragm pump used oil /antifreeze evacuation system is supplied with UL listed pump (647016), wall bracket, air installation kit, fluid installation kit, and drum style adapter kit. Air installation kit includes air regulator, air filter, hose, gauge and fittings. Fluid installation kit includes 4ft. (1.2m) and 10ft. (3.1m) fluid hoses, ball valve, and fittings. Drum style adapter kit to include ball valve camlock male and female couplers, and fittings.
c. Pump ratio- 1:1
d. Continuous duty flow rate- 50 GPM

e. Maximum fluid pressure- 100 PSI
f. Maximum air inlet pressure- 100 PSI
g. Fluid outlet size- 1” NPT
h. Air inlet size- 1/2” NPT
i. Used Oil Tank Overfill Protection
j. As manufactured by BJ Enterprises to include 007 High Level Tank Monitor & Alarm system complete with Indoor mount controller, remote tank sensor and 12 volt transformer. System to include 12 volt electric solenoid valve for control of diaphragm pump complete with 12 volt transformer.

4. GREASE PUMP SYSTEM

a. Grease pump to utilize 120 lb. drum systems and to include:
b. Fireball 300 50:1 120 lb. (55 kg) package (Graco #225014)
c. Graco 120 lb. (55 kg) length package, 50:1 ratio, pneumatically operated, double- ball and double acting pump. Air motor diameter is 3” with a 3” stroke. The air motor, air motor valves and lower pump are to be of the “in-line” design. The normal air requirements are 30-140 psi (2.8-10.4 bar) with air consumption of 18 scfm @100 psi (7 bar). Maximum fluid pressure of 8400 psi. Package includes a pump, hose/fitting kit, cover and follower plate. Hose/fitting kit includes 1/4” x 6ft. (1.8m) fluid hose, 3/8” x 6ft. (1.8m) air hose, and fittings.
d. Pump ratio- 50:1
e. Continuous duty flow rate- 1.2 LB./min
f. Maximum fluid pressure- 8400 PSI
g. Maximum air inlet pressure- 140 PSI
h. Fluid outlet size- 1/4” npt
i. Air inlet size- 3/8" npt
j. The following accessories are to be installed at each pump

1) Filter/Regulator & Gauge/Lubricator Assembly: Graco #110150
2) Bleed-Type Air Shut-Off Valve: Graco #110225
3) HP Fluid Shutoff Valve: Graco #202869

5. OVERHEAD REEL SYSTEM

a. Graco SD Series heavy duty reels shall be spring powered and self-retracting with a minimum of four replaceable roller guides incorporated in a sliding hose outlet to ensure an even rewind of hose onto the reel. Reel to incorporate structurally engineered frame made from high strength steel. Reel to include long lasting rewind spring with sealed bearing and open swivel ports for high fluid flow and minimal pressure loss. Reels shall carry a minimum three-year parts and labor warranty. Colors to be selected by Architect from full range of Manufacturer’s standard colors.
b. SD Series Heavy Duty Oil (Motor, Hydraulic, and Future Oil) Reels Graco #HPM65X

1) Hose length: 50’ x 1/2” ID
2) Reel outlet: ½”
3) Reel inlet: 1/2” npsm
4) Pressure rating: 2,000 psi

5) The following accessories are to be installed at each reel

a) Hose Inlet Kit: Graco #218549
b) Fluid Shutoff Valve: Graco #108458
c) SD Series Electronic Meter: Graco #255350
d) Reel Enclosure: Graco #24A218

c. SD Series Heavy Duty Grease Reel Graco #HPH55X Hose length-grease: 50’ x 3/8” ID

1) Reel outlet: 1/4”
2) Reel inlet: 3/8” npsm
3) Pressure rating grease: 4,000 psi
4) The following accessories are to be installed at each reel

a) Hose Inlet Kit- Graco #218550
b) Fluid Shutoff Valve- Graco #202869
c) ProShot Dispense Valve- Graco #242058
d) Z-Swivel- Graco #224569
e) Reel Enclosure:-Graco #24A218

d. SD Series Heavy Duty Air Reel Graco #HPL56X Hose length: 65’ x 3/8” ID

1) Reel outlet- 3/8”
2) Reel inlet- 1/2” npsm
3) Pressure rating- 300 psi
4) The following accessories are to be installed at each reel

a) Hose Inlet Kit- Graco #218549
b) Air Shutoff Valve- Graco #110225
c) Reel Enclosure- Graco #24A218
d) Air Coupler- Graco #110199
e) Nipple- Graco #110196

6. MISCELLANEOUS EQUIPMENT

a. End Panel Kit (1 kit per bank of reels): Graco #24A951
b. Reel Mounting Channels: Graco #203525

2.3 WORK BENCHES:

A. Provide work benches at indicated locations.

B. Manufacturers: Work bench products are based on Penco. Subject to compliance with the requirements, equal products by one of the following manufacturers will be acceptable

1. Lyon
2. Equipto

C. Materials:

1. Model: Penco #34570 with 34" x 72" x 12-gauge steel top, fixed steel legs, back and end rails.
2. Accessories for bench: #30962 lockable drawer, 20" width x 22” depth.
3. Color: To be chosen from manufacturer's standard range.

2.4 METAL SHELF UNITS:

A. Provide metal shelf units with seven adjustable shelves at indicated locations.

B. Manufacturers: Shelf products are based on Lyon. Subject to compliance with the requirements, equal products by one of the following manufacturers will be acceptable

1. Equipto
2. Penco
3. Republic

C. Materials:

1. General: Provide units to be self-supporting and rigid with fixed top and bottom panels. Provide intermediate shelves adjustable in not less than 2" vertical increments. Except as otherwise indicated, provide complete units of standard nominal sizes.
2. Sheet Steel: ASTM A 366, cold-rolled sheet, commercial quality, Class 1, matte finish, stretcher-leveled.
3. Fasteners: Cadmium-plated or zinc-plated steel, manufacturer's standard types and sizes.
4. Sheet Steel Finish: Manufacturer's standard baked enamel finish; minimum of 1.0 mils dry film thickness.
5. Provide coating with abrasion coefficient of 25 liters per mil when tested in accordance with ASTM D 968.
6. Steel Shelves: Design to support not less than 40 lbs. per sq. ft., with 3/16" maximum deflection, but not less than 20 gage with 3, 90 degree bends forming front edge.
7. Base, Support Panels, Tops: 20-gage steel, minimum.
8. Shelf Support System: Manufacturer's standard method and detail for adjustable shelves.
9. Color: To be chosen from manufacturer's standards.
10. Basis of design models include:

a. Lyons # 8030SH 12" x 36" x 84" Starter Unit
b. Lyons # 8030H 12" x 36" x 84" Add-on Unit
c. Lyons # 8500 12" x 84" Closed End Upright Unit
d. Lyons # 8031SH 18" x 36" x 84" Starter Unit
e. Lyons # 8031H 18" x 36" x 84" Add-on Unit
f. Lyons # 8397H 18" x 36" x 84" Add-on Unit
g. Lyons # 8506 18" x 84" Closed End Upright Unit
h. Lyons # 8032SH 24" x 36" x 84" Starter Unit
i. Lyons # 8032H 24" x 36" x 84" Add-on Unit

j. Lyons # 8511 24" x 84" Closed End Upright Unit

2.5 METAL BIN UNITS:

A. Provide metal bin units at indicated locations.

B. Manufacturers:Metal bin products are based on Durham Manufacturing Company. Subject to compliance with the requirements, equal products by one of the following

1. Metal Fabricating Corporation

C. Materials:

1. Except as otherwise indicated, provide units of standard 36" nominal width, with other comparable dimensions and properties as the following:
2. Color: To be chosen from manufacturer's standard range.

2.6 TRENCH DRAINS AND CATCH BASINS:

A. Provide trench drains and catch basins at indicated locations.

B. Manufacturers:Trench Drains and Catch Basins are based on ACO Polymer Products Inc. Subject to compliance with the requirements, equal products by one of the following manufacturers will be acceptable

1. ABT Inc.
2. Polycast Hubbel Incorporated

C. Materials:

1. General: Subject to compliance with requirements, provide polymer concrete insert trench drain assemblies and indicated catch basin assemblies (sand/sump boxes), with covers, fasteners, accessories, stiffeners and other items as needed for complete cast- in-place installation. All trench drains, catch basins, sumps and drain covers shall be heavy duty capable of supporting class “E” loads (trucks and fork lifts.) All drain covers and frames shall be cast iron.
2. Models:

a. Trench Drain (12” wide) Assembly: S300K
b. Catch Basin (14”x19”) Assembly: SK3-900 Series (with 612 base)
c. Sump Boxes Assemblies:

1) 36”x36” Catch Basin:05710
2) Gray Iron Frame and Slot Grate:05713
3) Custom Sized Catch Basin and Gray Iron Frame / Grate

2.7 WATER REEL SYSTEMS:

A. Provide water reel systems at indicated locations.

B. Manufacturers:

1. The water reel systems are based on Potter-Roemer. Subject to compliance with the requirements, an approved equal is acceptable.

C. Models:

1. 1” Continuous Flow Reel with additional hand crank
2. 1” Non-Collapsible Braided Synthetic Hose (Refer to drawings for hose lengths and locations)
3. 1” Couplings for Non-Collapsible Braided Synthetic Hose
4. 1” Brass Nozzle

PART 3 - EXECUTION

3.1 TRENCH DRAIN EXECUTION

A. INSTALLATION

1. Set grates of drains flush with finished surface, unless otherwise indicated.
2. Set with grates depressed according to the following drainage area radii

   a. Radius, **30 Inches** or Less: Equivalent to 1 percent slope, but not less than **1/4-inch** total depression.
   b. Radius, **30 to 60 Inches**: Equivalent to 1 percent slope.
   c. Radius, **60 Inches** or Larger: Equivalent to 1 percent slope, but not greater than **1-inch** total depression.

B. CONNECTIONS

1. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

C. PROTECTION

1. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
2. Place plugs in ends of uncompleted piping at end of each day or when work stops.

3.2 WATER REEL EXECUTION

A. INSTALLATION OF PIPING SPECIALTIES

1. Hose Reels: Install with valves on inlet.

   a. Install surface mounted on wall at 7’-0” from finish floor to center line.

B. PIPING CONNECTIONS

1. Drawings indicate general arrangement of piping, fittings, and specialties.
2. When installing piping specialties adjacent to equipment and machines, allow space for service and maintenance.

C. ADJUSTING

1. Set field-adjustable lengths of hose to be accessible from finish floor.

END OF SECTION 11 11 00

SECTION 11 11 19.20 - INTERIOR GREASE/OIL PIPING SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor will provide, install and make final connections to connecting piping running from the pumps to the reels. Provide hook-up of entire system, including all air lines to pumps, piping, and final connections.

B. Clean and test piping.

1.2 QUALITY ASSURANCE

A. Installation shall comply with the requirements of the State of Ohio Department of Commerce, Division of the State Fire Marshal.

B. Standards:

1. American National Standards Institute (ANSI).
2. National Fire Protection Association (NFPA).
3. Underwriters Laboratories, Inc. (U.L.).

C. All gaskets, packings, and other nonmetallic joining materials shall be rated no less than 1,000 deg. F.

PART 2 - PRODUCTS

2.1 PIPING

A. Motor Oil and Hydraulic Oil Piping: Schedule 40 black steel pipe (A 53, A 106) or hydraulic tubing, SAE J 525, seamless (or electric welded) low carbon steel tubing, 1010 1020 alloy, annealed soft, 1200 PSI operating pressure, (5/8 in. – 0.083 in. wall, 3/4 in. – 0.095 in. wall, 1 in. – 0.12 in. wall).

B. Grease Piping: Hydraulic tubing, SAE J 525, seamless (or electric welded) low carbon steel tubing, 1010 1020 alloy, annealed soft, 5000 PSI minimum operating pressure, (5/8 in. – 0.083 in. wall, 3/4 in. – 0.095 in. wall, 1 in. – 0.12 in. wall).

2.2 FITTINGS

A. Motor Oil, Gear Oil, and Hydraulic Oil Piping: Extra-heavy-duty fittings for black steel pipe. Flared compression type fittings for tubing.

B. Grease Piping: Flare lock fittings, compression type. Lenz “O Ring Seal” tube fittings.

2.3 PRESSURE RELIEF VALVES

A. Fulflow Specialties Co. VJ AS Series. U.L.-listed, cast iron, nonchattering, positive pressure, hydraulic bypass.

B. Other Acceptable Manufacturer: Approved equal by Webster.

2.4 AIR PRESSURE GAUGE

A. Weiss 4PGA 1. Standard single Bourdon tube, black die cast aluminum case, 4 1/2 in. diameter dial, chrome removable slip ring, gauge cock and pigtail, ±1% accuracy. Range shall be approximately 50% in excess of maximum pressure anticipated. Provide gauge cock.

B. Other Acceptable Manufacturers: Approved equal by Trerice, Marsh, Weksler, Marshalltown, or Ashcroft.

C. Provide spare gauge.

2.5 OIL PRESSURE GAUGE

A. Marshalltown. Bourdon tube type brass movement, satin black case, with 4 in. diameter dial, 0 to 3000 PSIG, 1/4 in. i.p.s. bottom connection.

2.6 HOSE REEL (SPECIFIC TYPES OF QUANTITIES TBD)

A. Reels provided and installed by the Contractor.

2.7 LUBRICANT PUMPS

A. Motor oil, hydraulic oil, future oil, and grease product pumps provided and installed by the Contractor.

2.8 LUBRICANT

A. Contractor shall furnish and install bulk tanks for lubricants.

PART 3 - EXECUTION

3.1 COORDINATION

A. Coordinate location of lines, tanks, and pumps with Owner and Contractor supplied equipment.

B. Coordinate location and rough-in requirements of equipment with Contractor.

C. The Contractor supplies and installs all piping, air regulators, and air pressure gauges. Contractor to provide fluid dispensing system including but not limited to pumps, hoses, dispensers, and dispenser nozzles.

3.2 INSTALLATION

A. Entire installation shall comply with the requirements of NFPA 30, 31, and 37.

B. Provide unions at each final connection and at each piece of equipment.

C. Flexible connector at the lube reels and lube pumps furnished and installed by the Contractor.

3.3 TESTS

A. Set air pressure on product pumps to 120 PSI, fill each system with product, and leak test piping for (4) hours. Repair all leaks. Reset product pump air pressure to Manufacturer’s recommendations.

END OF SECTION 11 11 19.20

SECTION 11 30 13 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cooking appliances.
2. Refrigeration appliances.

B. Related Requirements:

1. Section 224100 "Residential Plumbing Fixtures" for kitchen sinks, dishwasher air-gap fittings, waste (garbage) disposers, and instant hot-water dispensers.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Cooking appliances.
2. Refrigeration appliances.

B. Product Data Submittals: For each product.

1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.

D. Product Schedule: For appliances. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of appliance.

B. Field quality-control reports.

C. Sample Warranties: For manufacturers' special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each residential appliance to include in

operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

1.6 WARRANTY

A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain residential appliances from single source.

2.2 PERFORMANCE REQUIREMENTS

A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design.

2.3 COOKING APPLIANCES

A. Microwave Oven:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Amana; Whirlpool Corporation
b. GE Appliances; Haier Group
c. Whirlpool Corporation

2. Mounting: Countertop.
3. Type: Conventional.
4. Capacity: 2.0 cu. ft..
5. Microwave Power Rating: 1000 W.
6. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
7. Controls: Digital panel controls and timer display.

8. Other Features: Turntable.
9. Material: Manufacturer's standard.

2.4 REFRIGERATION APPLIANCES

A. Refrigerator/Freezer: Two-door, side-by-side refrigerator/freezer and complying with AHAM HRF-1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Amana; Whirlpool Corporation
   b. GE Appliances; Haier Group
   c. Whirlpool Corporation

2. Type: Freestanding.
3. Storage Capacity:

   a. Refrigeration Compartment Volume: 15.6 cu. ft..
   b. Freezer Volume: 5.13 cu. ft..

4. General Features:

   a. Dispenser in door for ice and cold water with dispenser lock.
   b. Dual refrigeration systems.
   c. Separate temperature controls for each compartment.

5. Refrigerator Features:

   a. Interior light in refrigeration compartment.

6. Freezer Features: One freezer compartment(s) with door(s).

   a. Automatic defrost.
   b. Interior light in freezer compartment.
   c. Automatic icemaker and storage bin.

7. Energy Star: Provide appliances that qualify for the EPA/DOE Energy Star product-labeling program.
8. Front Panel(s): Manufacturer's standard.
9. Appliance Color/Finish: Manufacturer's standard.

2.5 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install appliances according to manufacturer's written instructions.

B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
3. Operational Test: After installation, start units to confirm proper operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

B. An appliance will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 11 30 13

SECTION 11 40 00 - FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Self-contained refrigeration equipment.

1.2 COORDINATION

A. Coordinate locations and requirements of utility service connections.

B. Coordinate sizes, locations, and requirements of the following:

1. Equipment bases.
2. Floor depressions.
3. Floor areas with positive slopes to drains.
4. Floor sinks and drains serving foodservice equipment.
5. Roof curbs, equipment supports, and penetrations.

1.3 ACTION SUBMITTALS

A. Product Data

1. Self-contained refrigeration equipment.

B. Include the following:

1. Manufacturer's model number.
2. Accessories and components that will be included for Project.
3. Clearance requirements for access and maintenance.
4. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.

C. Samples for Verification: For each factory-applied color finish required, in manufacturer's standard sizes.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For foodservice equipment to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Product Schedule: For each foodservice equipment item, include the following:

1) Manufacturer's name and model number.
2) List of factory-authorized service agencies including addresses and telephone numbers.

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction contiguous with foodservice equipment by field measurements before fabrication. Indicate measurements on Coordination Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF standards.

B. UL Certification: Provide electric equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards, and that are UL certified for compliance and labeled for intended use.

C. Regulatory Requirements: Install equipment to comply with the following:

1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
2. NFPA 70, "National Electrical Code."

2.2 SELF-CONTAINED REFRIGERATION EQUIPMENT

A. Refrigeration Equipment: Freezers.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Kelvinator

2. Description: Chest type.

a. Exterior Finish: Stainless steel.
b. Interior Finish: Manufacturer's standard.
c. Doors: Top Hinge.
d. Accessories:

1) Casters.
2) Stainless steel back with rear louvers.

e. Electrical Service: Equip unit with plug and cord for service indicated on Drawings.

2.3 MISCELLANEOUS MATERIALS

A. Installation Accessories, General: NSF certified for end-use application indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install foodservice equipment level and plumb, according to manufacturer's written instructions.

1. Connect equipment to utilities.

B. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and with requirements of authorities having jurisdiction.

3.2 CLEANING AND PROTECTING

A. After completing installation of equipment, repair damaged finishes.

B. Clean and adjust equipment as required to produce ready-for-use condition.

C. Protect equipment from damage during remainder of the construction period.

3.3 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain foodservice equipment.

END OF SECTION 11 40 00

SECTION 122160 –WINDOW BLINDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide window treatment, conforming to NFPA 701, complete with necessary brackets, fittings, and hardware. Provide each window treatment type as a complete unit in accordance with paragraph WINDOW TREATMENT PLACEMENT SCHEDULE. Mount and operate equipment in accordance with manufacturer's instructions. Completely cover windows to receive treatment.

B. Section Includes:

1. Horizontal louver blinds with aluminum slats.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication and installation details for horizontal louver blinds.

C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.

D. Window-Treatment Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

1.4 INFORMATION SUBMITTALS

A. Product Certificates: For each type of horizontal louver blind.

B. Product Test Reports: For each type of horizontal louver blind, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Horizontal Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY

A. Provide manufacturers' standard performance guarantees or warranties that extend beyond a 1 year period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Hunter Douglas Contract.

2. Levolor Contract; a Newell Rubbermaid company.

C. C. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.

1. Width: 1 inch (25 mm).
2. Thickness: Manufacturer's standard.
3. Spacing: Manufacturer's standard.
4. Finish: Ionized antistatic, dust-repellent, baked polyester finish.
5. Features:
    a. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.

D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
1. Capacity: One blind per head rail unless otherwise indicated.
2. Ends: Manufacturer's standard.
3. Motorized Operating Mechanisms: Coordinate headrail with motorized operator requirements. Provide headrail acceptable to blind and motorized operator manufacturers and suitable for applications indicated.
4. Manual Lift Mechanism:

    a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
    b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
5. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
    a. Tilt: Full.
    b. Tilt: One-direction, positive stop or lockout limited at an angle of 80 degrees from horizontal, both directions.

c. Operator: Clear-plastic wand.
d. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.

6. Manual Lift-Operator and Tilt-Operator Lengths: Manufacturer's standard.
7. Manual Lift-Operator and Tilt-Operator Locations: Manufacturer's standard unless otherwise indicated.
8. Integrated Headrail Balance: Curved face.

E. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.

1. Type: Manufacturer's standard.

F. Lift Cords: Manufacturer's standard braided cord.

G. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.

1. Type: Braided cord.

H. Valence: Manufacturer's standard.

I. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.

1. Type: Wall or As indicated.
2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

J. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

K. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.

L. Colors, Textures, Patterns, and Gloss:

1. Slats: As selected by Architect from manufacturer's full range.
2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.3 HORIZONTAL LOUVER BLINDS FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):

1. Between (Inside} Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4-inch (6 mm) per side or 1/2 inch (13 mm) total, plus or

minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less than 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

2. Outside of Jamb Installation: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.

D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

F. Color-Coated Finish:

1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
2. Wood: Apply manufacturer's standard factory-applied finish complying with manufacturer's written instructions for surface preparation, application, and minimum dry film thickness.

G. COLOR:

1. Provide color, pattern and texture selected from manufacturer’s standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.

1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.

2. Install mounting and intermediate brackets to prevent the deflection of headrails.

3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings. CLEAN-UP.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer and ensure that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 122160

SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material aprons.
5. Solid surface material sinks.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS (SS-1)

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on drawings.
   a. Manufacturer: Wilsonart
   b. Color: 1573MB_5 Frosty White Mirage

2. Or comparable product by one of the following:

   a. DuPont; DuPont de Nemours, Inc.
   b. Formica Corporation.
   c. LG Hausys, Ltd.
   d. Swan Surfaces LLC (Swanstone).

3. Type: Provide Standard type unless Special Purpose type is indicated.

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.2 FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Premium.

B. Configuration:

1. Front (No casework below): Straight, slightly eased at top with separate apron, 4 inches (100 mm) high, recessed 1/4-inch (6.4-mm) behind front edge.
2. Front (casework below): Straight, slightly eased at top.
3. Backsplash: Straight, slightly eased at corner.
4. End Splash: Matching backsplash.

C. Countertops:

1. 1 ½ inch- (38.1-mm-) thick, solid surface material with front edge built up with same material.

D. Backsplashes and Endsplashes: 1/2-inch- (12.7-mm-) thick, solid surface material.

E. Joints:

1. Fabricate countertops without joints.

F. Cutouts and Holes:

1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

2.3 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer.

B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

C. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions.

D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive.

F. Install aprons to backing and countertops with adhesive.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

H. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

SECTION 13 31 23 - TENSION FABRIC STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Ohio Revised Code: Domestic steel use requirements as specified in Section 153.011 of the Ohio Revised Code apply to this project.

1.2 SUMMARY

A. This Section includes the installation of structural framing and fabric membrane at roof and at walls to the extent shown on the project drawings.

1. The fabric membrane shall be tensioned over the framework to form a water tight seal.
2. Arch Trusses: HDPE fabric membrane that cover each bay using an extrusion and keder system is acceptable. Any other options will be reviewed by the AE for acceptance.
3. Straight linear Trusses: HDPE fabric membrane can be a single cover or sections that form a water tight seal.
4. The buildings system shall also include accessories and items required and necessary for the scope and intended use and as specified; including ventilation (louvers or mesh, per manufacturer’s calculations) and support for lighting.

1.3 REFERENCES AND STANDARDS

A. The following publications are for the standards listed below but referred to thereafter by basic letter designation only. They form a part of this specification to the extent referenced thereto use latest editions.

B. American Institute of Steel Construction (AISC):

1. Manual of Steel Construction
2. Specification of Structural Steel Buildings
3. Structural Joints Using ASTM A325 or A490

C. American Iron and Steel Institute (AISI):

1. Manual of Steel Construction

D. American Society for Testing and Materials (ASTM):

1. A36 Standard Specification for Carbon Structural Steel
2. A 123 Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
3. A 307 Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

4. F3125 Standard Specification for High-Strength Structural Bolts for Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength
5. A 500 Standard Specifications for Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round, Square, and Rectangular Shapes
6. A 563 Standard Specification for Carbon and Alloy Steel Nuts
7. A 687 Standard Specification for High-Strength Non-Headed Steel Bolts and Studs

E. American Society of Civil Engineers (ASCE):

1. ASCE 7 Minimum Design Loads for Building and Other Structures

F. American Welding Society (AWS):

1. D1.1 Structural Welding Code – Steel

G. National Fire Protection Association (NFPA):

1. 701 Standard Methods of Fire Tests for Flame Propagation Textiles and Films

1.4 PERFORMANCE REQUIREMENTS

A. Structural Frame Performance: Provide structures capable of withstanding the effects of gravity loads, wind loads, and seismic loads as stated by the Ohio Building Code and under conditions “indicated”.

1. Frame supported membrane structure shall comply with the following maximum story drift and maximum vertical deflection requirements:
2. Maximum Story Drift: H/100
3. Maximum Vertical Deflection: LL=L/360 & TL=L/240 (horizontal elements)
4. Roof Loads: In addition to its own weight (Dead Load), the structure shall be designed based upon a ground snow load in accordance with the Ohio Building Code plus a 3 psf collateral load. At minimum, the structure shall be capable of supporting a roof live load of 12 pounds per square foot and a collateral load of 3 pounds per square foot projected over the entire roof area or a portion of the roof area, and any probably arrangement of loading resulting in the highest stress in the members.
5. Arch trusses and Purlins: To provide for structural stability, to minimize unsupported areas of membrane fabric in the roof and to provide for installation of accessory items, the main structural trusses shall be laterally braced by rounded tubular purlins. “C”, “J”, “U”, “X”, and “Z” sections are not acceptable.
6. Wind and Frame Bracing: The structure shall be appropriately stabilized with main wind bracing cable or rod assemblies as well as any required secondary node restraint assemblies so as to efficiently transfer wind, snow and seismic induced stresses to the foundation/anchoring system. Cable diameters for main wind bracing shall be a minimum of 3/8” diameter for structures under 130’ span. For structures between 130’ and 200’ span, cable diameters should be a minimum of ½” and for structures over 200’ span, cable diameters should be a minimum of 5/8”. The end bays of the structure shall be designed to be “X” braced early during installation to allow for permanent stability of the frame as

early as practicable during the installation process. The structural frame shall be provided with engineered attachment clips or lugs for all main cable assemblies. These clips shall be a minimum 3/8” thick A36 steel and shall be designed to properly transfer wind bracing forces within the structural frame.

7. Connecting Joints: Connections for structural elements and HDPE membrane shall be properly designed with required safety factors so as to transfer all the maximum forces present in a given joint. All connections are per manufacturers requirements.
8. Where sleeve joints are used, the material shall be appropriately sized and reinforced so as to avoid shear failure of the material. Primary axial steel connections shall also be made with bolts of at least 5/8” diameter grade hot dipped galvanized A325. Secondary purlins shall be secured by no less than ½” diameter hot -dipped galvanized bolts.
9. Mechanical Equipment Interface: The main structural roof trusses shall allow for installation of electrical and mechanical equipment between the inner and outer surfaces of the truss framework. Likewise, the structure shall accept penetrations through the membrane for access doors and mechanical services with minimal modification.
10. Alternative Cladding Materials: The structure shall be designed such that alternative covering materials such as metal roof and/or wall cladding can be added with minimal modification, if required.
11. Shipping: The main structural trusses shall be two dimensional, planar trusses which nest tightly together in order to minimize shipping and storage volume.
12. Ancillary Systems: The structure shall be designed such that it can be readily retrofitted with insulation systems and other ancillary systems such as lighting, sprinklers, HVAC, etc. as required.
13. Thermal Movements: Provide structures that allow for thermal movements reaching from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base the engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss
14. Temperature Change (Range): 120 deg F (48.8 deg C). ambient: 100 deg F (37.8 deg C), material surfaces.

B. Coated Membrane Cladding System Performance, High Density Polyethylene (HDPE):

1. Continuous, Weather Tight Membrane: The structure membrane shall form a continuous, uninterrupted weather tight shell over the framework. In order to provide for a good finished appearance and to insure weather tightness, the gable wall HDPE cladding shall be manufactured so as to be connected in one piece to the adjacent side wall and roof cladding without the use of catenary cables.
2. Cladding Section Joints: Adjacent HDPE cladding sections shall either lace together with a minimum ¼” white polyester rope or be provided with a mechanical tensioning system so as to maintain HDPE tension along the length of the building. Proper gaps shall be maintained between sections so as to allow sufficient distance to enable full tensioning of the material.
3. Overlap Seams: The membrane system shall be designed such that the HDPE cladding panels can be supplied with optional overlap joints to allow adjacent panels to be field heat sealed together.

4. Base Tensioning System: The HDPE cladding will be provided with a mechanical tensioning system that allows the HDPE to be fully tensioned around the structure perimeter. The system will be designed such that the membrane can be tightly and neatly secured over the structural frame and such that the system has remaining range of adjustment.
5. Membrane Seal at Openings and Base: The structure supplier will provide all materials and methods necessary to fully tension and seal the membrane material around all door, ventilation and other openings as well as around the structure perimeter below the main tensioning system. This seal shall provide a neat finished appearance and eliminate any loose HDPE cladding that could otherwise be damaged by flapping or abrasion. When a HDPE base skirt is required, this shall be supplied as part of the continuous cover and welded on with the main HDPE cladding and attached at the base perimeter to allow a reasonable seal against air and water intrusion.
6. Design Safety Factor: The HDPE membrane shall be designed to allow a factor of safety at design loads of at least three (3) times the theoretical design strength of the HDPE material.
7. The structure membrane shall not be designed to function as a structural member such that, should any damage to or penetrations of the membrane occur, the integrity of the structural framework shall not be affected

1.5 SUBMITTALS

A. Product Data: include construction details, material descriptions, dimensions of individual components and profiles, and finishes for tensioned membrane structures.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by qualified professional engineer responsible for their preparation
2. For installed products that vary from design, submit complete information to facilitate construction of concrete retaining walls and base.

C. Samples for Initial Selection: Submit 6-inch by 6-inch samples of fabric of each available color from manufacturer's full range.

D. Samples for Verification: Submit samples of fabric including stitching at splices, 12 inch long samples of structural members, connectors, etc.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer end witnessed by a qualified testing agency.

F. Maintenance Data: For tensioned membrane structures to include maintenance manuals.

G. Warranties: Special warranties specified in this Section Field quality-control test and inspection reports.

H. Professional Engineer's Certificate: All fabrication documents are to be prepared, signed and sealed by a Professional Engineer, legally authorized to practice in the State of OHIO, verifying that the structural framing and covering panels meet indicated loading requirements and codes.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain tensioned fabric structure components through one source from a single manufacturer.

1. Basis of Design Product: Span-Tech, by Hawkeye Steel, or comparable product by one of the following:
2. Clear Span Fabric Structures, Inc.
3. Accell Building Systems, LLC
4. Britespan Building Systems, Inc.
5. Rush-Co Rushmore Buildings
6. Legacy Building Solutions
7. Guard-All Building Solutions

B. Product Options: Information on Drawings and In Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as may relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

C. Product Options-1: Drawings indicate size, profiles, and dimensional requirements of tensioned membrane structures and are based on the specific system indicated.

1. Do not modify intended aesthetic effects, as judged solely by Owner, except with Owner's approval. If modifications are proposed; submit comprehensive explanatory data to Associate for review.

D. Welding: Quality procedures and personnel according to the following:

1. AWS D1.1,"Structural Welding Code- Steel."
2. AWS D1.2, "Structural Welding Code -Aluminum."

E. Pre-installation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual field conditions by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Exterior Dimension: The structure shall have the dimensions as indicated on the documents.

C. Clear Interior Volume: Each interior bay of the structure shall provide as a minimum a clear unobstructed interior as indicated on the documents.

1.8 COORDINATION

A. Coordinate installation of anchorages for building system. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor delta, and items with integral anchors, that are to be embedded in concrete. Deliver such items to Project site in time for installation.

1.9 WARRANTY

A. Special Warranty on building system: Manufacturer agrees to repair or replace building components that show evidence of deterioration of factory or field applied finishes within specified warranty period.

1. Warranty Period from date of Contract Completion:
2. Membrane: Minimum 10 years including all equipment and labor
3. Steel Corrosion: 4 years full coverage against corrosion on all main truss components including end walls, hot dipped galvanized nuts, and bolts.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials used in the structure shall be new, without defects and free of repairs. The quality of the materials used shall be such that the structure is in conformance with the performance requirements specified herein.

B. Cladding Membrane: The structure shall be clad with a HDPE coated polyester fabric manufactured by an approved and reputable supplier with demonstrated long term performance. Laminated materials are not acceptable for use on the outer weather membrane. The HDPE coated membrane fabric shall be waterproof and free from defects. All roofs, end walls and connecting sections shall be weather tight. The material will be selected from the manufacturer’s standard colors for the side walls and will be translucent white on the roof.

C. The material must be UV stabilized and flame retardant, must carry a minimum ten year manufacturer’s warranty and must have life expectancy of 15 to 20 years. The minimum fabric specification is as follows:

D. Provide Single Piece Tension Membrane: Fabric specifications:

1. Base Scrim

a. HDPE (600 Darnier yarn) High Density Polyethylene

2. Coating Thickness

a. 4 mil each side Minimum 4 to 8 mil exterior coating each side of base scrim

3. Surface Type

a. Modified LDPE c/w UV Modified Low Density Polyethylene coating with UV inhibitors

4. Weight

a. 2.0 Oz./SY Minimum 12.6 Oz./SY

5. Grab Tensile

a. Strength360 Lb.ASTM D-5034

6. Tear Torque Strength

a. 90 Lb. ASTM D-2261

7. Strip Tensile Strength

a. 250 Lb. ASTM D-5035

8. Mullen Burst

a. 650 Lb. ASTM D-3786

9. Thickness

a. 23 mils STM D-5199

10. Hydrostatic Resistance

a. 171 PSI ASTM D-7514

11. Cold Crack -

a. 40 degrees F ASTM D-2136 12.

12. Light Transmission

a. 13% ASTM E-403

13. UV & Weathering

a. 90% ret. 2000 Hr ASTM D-4399

14. Permeability

a. 2.5 X 10E ASTM D-1491

15. Scale Flame Spread

a. Pass char 6.5 FS 10 SD 58 ASTM E-64

E. Exterior fabric is not an integral part of the structural system. Exterior fabric will deflect under load, therefore, all building accessories must be located beneath the inner chord of the truss. Anything above the inner chord must be reviewed and approved in writing by the building manufacturer. Severe damage to the building and accessories may result from failure to comply with this requirement.

F. For salt storage, end wall fabric shall have at least two louvers (each 2 feet by 2 feet minimum) or mesh fabric as an alternate.

G. Anchor Bolts

1. Anchor bolt diameters are determined in accordance with ASTM F-1554 Standard Stainless Steel.
2. Anchor bolt projections based on no grout are as follows: 2” minimum
3. The foundation must be level, square (at right angles); and smooth. Anchor bolts must be accurately placed as shown on the roof manufacturer’s drawings.
4. Drill-in expansion anchors are permitted.

H. Structural Bolts

1. Bolts in connections not subject to tension loads or where loosening due to vibration or load fluctuations are not design considerations need only be snug tightened, which is defined as the tightness that occurs when all pieces in a joint are in firm contact.
2. All bolts conform to ASTM A325.
3. All bolts shall be hot dipped galvanized.
4. All bolt references require both bolt, washer, and nut.
5. Bolts in connections with tension loads require pre-tensioning to minimum tension.

I. Steel specifications: All steel members shall be a round tubular hot dipped post fabrication galvanized steel

1. Structural plate conforms to the following specifications: ASTM A5721 GR 44
2. HSS (Hollow Steel Section) A572 GR 44
3. Coatings of structural plates are hot dipped galvanized to a nominal coating Zinc weight as required under section 1.3 A 3b.
4. Coatings of tubes are hot dipped galvanized to a nominal Zinc weight as required under section 1.3 A 3b.
5. Steel finishing – Post fabrication, hot dipped galvanized.
6. Diagonal brace steel cable extra high strength per ASTM A475.
7. Cross cables – hot dipped galvanized.
8. Sway cables – hot dipped galvanized.
9. Structural components are as follows: “By manufacturer”
10. Miscellaneous steel:
11. Steel posts A 500 Grade B
12. Steel columns and beams A 500 Grade B
13. Hot dipped galvanized

J. Structural supports shall be spaced by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Erection.

1. The erector must provide safe working conditions and practices conforming to all safety regulations. All lifting devices are to be specifically designed to lift the various building components. Slings and spreader bars are to be used to prevent permanent deformation of all structural components.
2. Erection should start at a braced bay. Erect temporary support trusses. Use temporary bracing as required to ensure stability of the frames. Install purlins and cross bracing. Plumb and square trusses in accordance with OSHA OFR Part 1926- Safety Standards for Steel.
3. Ensure all purlins remain parallel.
4. Structural framing members are considered plumb, level, and aligned when the variance does not exceed 1:300.

3.2 INSTALLATION

A. Handling: The installation contractor shall be responsible for unloading, field storage, protection and transfer to the work area of all materials and equipment required to perform work. At no time shall materials be dropped, thrown or dragged over the transport equipment or the ground. Damage to any piece under its own superimposed weight shall be cause for repair or replacement. Material shall be protected from standing water.

B. quantities based on the shipping documents.

C. Foundation Design

1. The building manufacturer shall provide the purchaser with a copy of the foundation/anchoring requirements and if applicable, the anchor bolt plan, truss and leg truss line location and reactions. The anchor bolt plan shall show the anchor bolt(s), material, number, size location, embedment, projection and spacing. Design of the foundation and/or anchoring systems for the building shall be based on the maximum column/truss reactions as determined and provided by the building manufacturer.

D. Set structural frame plumb and aligned. Level base plates true to plane with full bearing on concrete bases.

E. Fasten frame system to concrete bases per manufacturer's standard design utilizing stainless steel components only.

END OF SECTION 13 31 23

SECTION 13 34 19 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal building systems.
2. Structural-steel framing.
3. Metal wall panels.
4. Foamed-insulation-core metal wall panels.
5. Metal soffit panels.
6. Personnel doors and frames.
7. Horizontal sliding doors.
8. Windows.
9. Translucent panels.
10. Accessories.

B. Related Requirements:

1. Division 03 concrete Sections for anchor rod installation, concrete, reinforcement, and formwork requirements.
2. Section 074113 "Insulated Metal Roof Panel" for roof system.
3. Section 074213 "Insulated Metal Wall Panel" for wall system.
4. Section 077253 "Snow Guards" for devices designed to hold snow on the roof surface.
5. Section 083323 "Overhead Coiling Doors" for coiling vehicular doors in metal building systems.
6. Section 083613 "Sectional Doors" for sectional vehicular doors in metal building systems.

1.2 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

B. Bay: Dimension between main frames measured normal to frame (at centerline of frame) for interior bays, and dimension from centerline of first interior main frame measured normal to end wall (outside face of end-wall girt) for end bays.

C. Building Length: Dimension of the building measured perpendicular to main framing from end wall to end wall (outside face of girt to outside face of girt).

D. Building Width: Dimension of the building measured parallel to main framing from sidewall to sidewall (outside face of girt to outside face of girt).

E. Clear Span: Distance between supports of beams, girders, or trusses (measured from lowest level of connecting area of a column and a rafter frame or knee).

F. Eave Height: Vertical dimension from finished floor to eave (the line along the sidewall formed by intersection of the planes of the roof and wall).

G. Clear Height under Structure: Vertical dimension from finished floor to lowest point of any part of primary or secondary structure, not including crane supports, located within clear span.

1.3 References

A. AISI S100 – North American Specification for the Design of Cold-Formed Steel Structural Members - Latest Edition.

B. AISC 360 - Specification for Structural Steel Buildings, Chicago, IL

C. AISC Steel Design Guide Series 3 - Serviceability Design Considerations for Low- Rise Building latest edition, Chicago, IL.

D. ASTM A36 - Specification for Carbon Structural Steel.

E. ASTM A325 - Specification for Structural Bolts, Steel, Heat Treated.

F. ASTM A475 - Specification for Zinc-Coated Steel Wire Strand.

G. ASTM A529 - Specification for High-Strength Carbon-Manganese Steel of Structural Quality.

H. ASTM A572 - Specification for High Strength Low-Alloy Columbium-Vanadium Steel.

I. ASTM A1011 SS or ASTM A1011HSLAS - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low- Alloy with Improved Formability.

J. ASTM A792 - Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.

K. ASTM A992 - Specification for Structural Steel Shapes.

L. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.

M. ASTM C1311 – Standard Specification for Solvent Release Sealants.

N. ASTM D1494 - Test Method for Diffuse Light Transmission Factor of Reinforced Plastic Panels.

O. ASTM D2244 - Practice for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

P. ASTM D4214 - Test Method for Evaluating the Degree of Chalking of Exterior Paint

Films.

Q. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

R. ASTM E283 - Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

S. ASTM E331 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.

T. ASTM E1514 – Standard Specification for Structural Standing Seam Steel Roof Panel Systems.

U. ASTM E1592 - Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

V. ASTM E1646 - Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

W. ASTM E1680 - Test Method for Rate of Air Leakage through Exterior Metal Roof Panel Systems.

X. ASTM E 2140 – Standard Test Method for Water penetration of Metal Roof Panel Systems by Static Water Pressure Head.

Y. AWS A2.4 - Standard Welding Symbols.

Z. AWS D1.1 - Structural Welding Code – Steel.

AA. AA. AWS D1.3 - Structural Welding Code - Sheet Steel.

BB. BB. FM4471 – Factory Mutual Research Corporation Standard 4471 Class 1.

CC. IAS - International Accreditation Service, Inc.

DD. MBMA Metal Building Systems Manual - Latest Edition.

EE. NAIMA 202 - Standard for Flexible Fiberglass Insulation Systems in Metal Buildings.

FF. UL 580 - Underwriters Laboratory -Tests for Uplift Resistance of Roof Assemblies .

GG. UL 790 – Underwriters Laboratory – Test Methods for Fire Tests of Roof Coverings.

HH. UL 2218 Underwriters Laboratory – Impact Resistance of Prepared Roof Covering Material.

II. SSPC-SP2 - Steel Structures Painting Council, Surface Preparation Specification No. 2, Hand Tool Cleaning.

JJ. ANS/SDI A250.8 Specifications for Standard Steel Doors and Frames (SDI-100).

KK. ASTM E119 – Standard Methods of Fire Tests of Building Construction and Materials.

1.4 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Division 03 concrete Sections.

B. Coordinate imposed load of cranes,,HVAC,,electrical equipment, and piping loads specified in other Sections with structural performance requirements specified in this Section.

C. Exterior walls are covered with factory-finished insulated foam core wall panels attached to framing members and furring over masonry walls where shown. Provide all louvers.

D. Roof system consists of insulated foam core standing-seam metal roof panels. Provide all roof penetration seals. Coordinate installation of roof curbs, equipment supports, and roof penetrations, which are specified elsewhere.

E. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

F. Manufacturer’s standard building structural components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements, including concrete masonry on the elevation.

G. The intent of this specification section is to provide the manufacturer’s standard insulated foam core metal panels that meet or exceed the specifications. In the event a manufacturer’s standard panel specification does not comply, the manufacturer is to supply panel products that exceed specified performance in all aspects.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conferences: Conduct conferences at Project site. Contractor, Manufacturer, Owner, and Architect of Record shall attend this conference.

1. Metal Building Systems Conference: Review methods and procedures related to metal building systems including, but not limited to, the following:

    a. Condition of foundations and other preparatory work performed by other trades.
    b. Structural load limitations.
    c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
    d. Required tests, inspections, and certifications.

e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.

2. Metal Building Roof Panel Conference: Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:

a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
b. Structural limitations of purlins and rafters during and after roofing.
c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
d. Temporary protection requirements for metal roof panel assembly during and after installation.
e. Roof observation and repair after metal roof panel installation.

3. Metal Building Wall Panel Conference: Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:

a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
b. Structural limitations of girts and columns during and after wall panel installation.
c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
d. Temporary protection requirements for metal wall panel assembly during and after installation.
e. Wall observation and repair after metal wall panel installation.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following.

a. Structural-steel-framing system.
b. Insulated foam core metal roof panels.
c. Insulated foam core metal wall panels.
d. Flashing and trim.
e. Accessories.

B. Shop Drawings: By manufacturer of metal building systems. Indicate components by others. Include full building plan, elevations, sections, details, and the following:

1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
2. Structural-Framing Drawings: Indicate complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted

connections, distinguishing between shop and field applications. Include transverse cross-sections.

a. Indicate provisions for attaching cranes, roof curbs,,and pipe racks.

3. Metal Panel Layout Drawings: Indicate roof and wall. layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; indicate locations of exposed fasteners.

a. Indicate roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, and items mounted on roof curbs.
b. Indicate wall-mounted items including personnel doors, vehicular doors, windows, louvers, and lighting fixtures.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

a. Flashing and trim.
b. Gutters.
c. Downspouts.
d. Louvers.
e. Roof Curbs.

C. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish.

1. Panels: 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
3. Vapor-Retarder Facings: Minimum **6-inch-** square Samples.
4. Accessories: Samples for each type of accessory.

E. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.

F. Delegated Design Submittals: For metal building systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

1. Name and location of Project.
2. Order number.
3. Name of manufacturer.
4. Name of Contractor.
5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, in accordance with governing building code.
10. Torque requirements for bolted connections.
11. Building-Use Category: Indicate category of building use and its effect on load importance factors.
12. AISC Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
13. Design calculations.

B. Welding certificates.

C. Erector Certificates: For each product, from manufacturer, and signed by manufacturer certifying that the erector complies with requirements.

D. Manufacturer Certificates: For each product, from manufacturer, and signed by manufacturer certifying that products comply with requirements.

E. Material Test Reports: For each of the following products, by a qualified testing agency:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, and bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor-retarder facings. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.

G. Source quality control reports.

H. Field quality control reports.

I. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor that performed surveys certify their accuracy.

J. Qualification Statements: For manufacturer erector land surveyor and professional engineer.

K. Delegated Design Engineer Qualifications: For metal building system.

L. Sample Warranties: For special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes.

B. Manufacturers inspection report.

1.9 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Material: Furnish extra materials, from the same production run, to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Component: 3% full length of wall panels. Review with district facilities administrator.
2. Provide 3% excess Nuts, Bolts, Screws, Washers and other required fasteners for each metal building.

1.10 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
2. Engineering Responsibility: Metal building system design and preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.
3. Member of MBMA (Metal Building Manufacturing Association)

B. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

C. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

1. Minimum of 5 years’ experience in this or similar trade
2. Five similar installation references in past 3 years

D. Land Surveyor Qualifications: A professional land surveyor who practices in jurisdiction

where Project is located and who is experienced in providing surveying services of the kind indicated.

E. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

F. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:

1. AWS D1.1/D1.1M.
2. AWS D1.3/D1.3M.

G. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

1. Domestic Steel Certificate: Certify compliance with Section 153.011 of the Ohio Revised Code.

H. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold- Formed Steel Structural Members" for design requirements and allowable stresses.

I. Fire-Resistance Ratings: Where indicated, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
2. Combustion Characteristics: ASTM E 136.

J. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies is to comply with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and with the following:

1. DHI Fire and Egress Door Assembly Inspector (FDAI) certification.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect foam-plastic insulation as follows:

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of foam-plastic materials as rapidly as possible in each area of construction.

1.12 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed in accordance with manufacturers' written installation instructions and warranty requirements.

B. Field Measurements:

1. Established Dimensions for Foundations: Comply with established dimensions on approved anchor-bolt plans, establishing foundation dimensions and proceeding with fabricating structural framing without field measurements. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.
2. Established Dimensions for Metal Panels: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal panels without field measurements or allow for field trimming metal panels. Coordinate construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.13 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period due to any cause.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight due to material or installation failure within specified warranty period with a NO dollar limit.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal building system.

B. Structural Performance: Metal building systems to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated in accordance with procedures in MBMA's "Metal Building Systems Manual":

1. Design Loads: As indicated on Drawings and as required by Ohio Building Code.

a. See also structural drawings for design loads
b. Live Loads: Include vertical loads induced by the building occupancy indicated on Drawings. Include loads induced by maintenance workers, materials, and equipment for roof live loads.
c. Building Occupancy: As indicated on Drawings.
d. Roof Snow Loads: Include vertical loads induced by the weight of snow, as determined by Ohio Building Code. Allow for unbalanced and drift loads.
e. Wind Loads: Include horizontal loads induced by a basic wind speed as required by Ohio Building Code
f. Collateral Loads: Collateral loads include additional dead loads over and above the weight of the metal building system such as liner system, rigid roof insulation, lighting, garage equipment, sprinkler systems and roof-mounted mechanical systems, make-up air units, door opening motors, canopies. Include individual mechanical units and not less than 5 LBF/SQ.FT loading.

1) Structural Framing and Roof and Siding Panels: Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the Metal Building Manufacturers Association's (MBMA) "Design Practices Manual" and the Ohio Building Code. Provide framing to support make-up air units, exhaust fans, vehicle service reels and vehicle exhaust reels. Confirm loads with contractors for that work. Design connections to the pre- engineered structure for the masonry exterior walls. For smaller mechanical equipment items, respective mechanical trades Contractor to provide steel supports and connectors, but metal building supplier must provide connection details of hangers to the structure.

2) Contractors shall confirm weight and dimensions with manufacturer and coordinate final locations.

g. Auxiliary Loads: Include dynamic live loads, such as those generated by cranes and materials-handling equipment indicated on Drawings.
h. Load Combinations: Design metal building systems to withstand the most critical effects of load factors and load combinations as required by the Ohio Building Code

2. Deflection and Drift Limits:

a. Deflection to be no greater than the following:

1) Purlins and Rafters: Vertical deflection of 1/360 of the span under Live Load, Snow Load, or Wind Load and 1/240 of the span under Dead Load plus Live Load.
2) Girts: Horizontal deflection of 1/240 of the span.
3) Metal Roof Panels: Vertical deflection of 1/240 of the span.
4) Metal Wall Panels: Horizontal deflection of 1/180 of the span.
5) Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
6) Lateral Drift: Maximum of 1/500 of the building height.
7) Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

C. Seismic Performance: Metal building system to withstand the effects of earthquake motions determined in accordance with Ohio Building Code.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

E. Structural Performance for Metal Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E1592:

1. Wind Loads: As indicated on Drawings.

F. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested in accordance with ASTM E1680 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft..

G. Air Infiltration for Metal Wall Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested in accordance with ASTM E283/E283M at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

H. Water Penetration for Metal Roof Panels: No water penetration when tested in accordance with ASTM E1646 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft..

I. Water Penetration for Metal Wall Panels: No water penetration when tested in accordance with ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: A minimum differential pressure of 20 percent of inward acting, wind load design pressure of not less than 6.24lbf/sqft (330 Pa) and not more than 12lbf/sq.ft (575 Pa).

J. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

K. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Approvals' "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: Class 1A- 105.
2. Hail Resistance: SH.

L. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested in accordance with ASTM C1363 or ASTM C518:

1. Roof:

a. R-Value: 30.

2. Walls:

a. R-Value: 27.

2.3 METAL BUILDING SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Metal building by Nucor Building Systems; a Nucor Company or comparable product by one of the following:

1. ACI Building Systems, Inc.
2. American Buildings Company; a Nucor company

B. System Description: Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

1. Provide metal building system of size and with bay spacing, roof slopes, and spans as indicated in the construction document.
2. Primary-Frame Type:

    a. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

3. End-Wall Framing:

    a. Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.

4. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior-framed (bypass) girts.
5. Eave Height: As indicated on Drawings.
6. Bay Spacing: As indicated on Drawings.
7. Roof Slope: 2 inches per 12 inches.
8. Roof System: Manufacturer's standard standing-seam, vertical-rib, insulated metal roof panels. Refer to section 074113 "Insulated Metal Roof Panels".
9. Exterior Wall System: Manufacturer's standard foamed-insulation-core metal wall panels.

2.4 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360.

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI S100 for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

    a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
3. Rigid Modular Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
4. Truss-Frame, Clear-Span Frames: Rafter frames fabricated from joist girders,

and I-shaped column sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.

5. Truss-Frame Modular Frames: Rafter frames fabricated from joist girders, and I-shaped column sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
6. Long-Bay Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Provide interior columns fabricated from round steel pipes or tubes, or shop-welded, built-up steel plates.
7. Frame Configuration: Single gable.
8. Exterior Column: Tapered unless noted otherwise.
9. Rafter: Tapered.

E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins:

   a. C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum **2-1/2-inch-** wide flanges.
   b. Steel joists of depths indicated on Drawings.

      1) Depth: Minimum depth as indicated. Greater depth as needed to comply with system performance requirements..

2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum **2-1/2-inch-** wide flanges.

   a. Depth: Minimum depth as indicated. Greater depth as needed to comply with system performance requirements..

3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
4. Flange Bracing: Minimum **2-by-2-by-1/8-inch** structural-steel angles or **1-inch-** diameter, cold-formed structural tubing to stiffen primary-frame flanges.
5. Sag Bracing: Minimum **1-by-1-by-1/8-inch** structural-steel angles.

6. Base or Sill Angles: Manufacturer's standard base angle, minimum **3-by-2-inch**, fabricated from zinc-coated (galvanized) steel sheet.
7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
8. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

G. Bracing: Provide adjustable wind bracing using any method as follows:

1. Rods: ASTM A36/A36M; ASTM A572/A572M, Grade **50**; or ASTM A529/A529M, Grade **50**; minimum **1/2-inch-** diameter steel; threaded full length or threaded a minimum of **6 inches** at each end.
2. Cable: ASTM A475, minimum **1/4-inch-** diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.

H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

I. Materials:

1. W-Shapes: ASTM A992/A992M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A36/A36M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
3. Plate and Bar: ASTM A36/A36M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
4. Steel Pipe: ASTM A53/A53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A1011/A1011M, Structural Steel (SS), Grades **30 through 55**, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades **45 through 70**; or cold-rolled, ASTM A1008/A1008M, Structural Steel (SS), Grades **25 through 80**, or HSLAS, Grades **45 through 70**.
7. Metallic-Coated Steel Sheet: ASTM A653/A653M, SS, Grades **33 through 80**, or HSLAS or HSLAS-F, Grades **50 through 80**; with **G60** coating designation; mill

phosphatized.

8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A755/A755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, SS, Grades **33 through 80**, or HSLAS or HSLAS-F, Grades **50 through 80**; with **G90** coating designation.
    b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, SS, Grade **50 or 80**; with Class **AZ50** coating.

9. Joist Girders: Manufactured in accordance with "Standard Specifications for Joist Girders," in SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for primary framing.
10. Steel Joists: Manufactured in accordance with "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for secondary framing.
11. Non-High-Strength Bolts, Nuts, and Washers: ASTM A307, Grade A, carbon-steel, hex-head bolts; ASTM A563/A563M carbon-steel hex nuts; and ASTM F844 plain (flat) steel washers.

    a. Finish: Mechanically deposited zinc coating, ASTM B695, Class 50.

12. High-Strength Bolts, Nuts, and Washers, Grade A325 (Grade A325M): ASTM F3125/F3125M, Type 1, heavy-hex steel structural bolts; ASTM A563/A563M, **Grade DH**, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

    a. Finish: Mechanically deposited zinc coating, ASTM B695, Class 50.

J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Clean and prepare in accordance with SSPC-SP2.
2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of **1 mil**.

    a. SSPC-Paint 15, Type I, red oxide.
    b. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of **0.5 mil** on each side.

2.5 METAL ROOF PANELS

A. Refer to Section 074116 "Insulated Metal Roof Panel" for roof system.

2.6 METAL WALL PANELS

A. Refer to Section 074213.19 "Insulated Metal Wall Panel" for exterior wall system.

B. Flush-Profile, Metal Liner Panels : Solid panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels; designed for interior side of metal wall panel assemblies and installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

a. Exterior Finish: Polyester.
b. Color: Igloo White.

2. Panel Coverage: 12 inches.
3. Panel Height: 1.5 inches.

C. Finishes:

1. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil**.

2.7 PERSONNEL DOORS AND FRAMES

A. Swinging Personnel Doors and Frames:

1. As specified in Section 081113 "Hollow Metal Doors and Frames."

2.8 WINDOWS

A. Aluminum Windows:

1. As specified in Section 085113 "Aluminum Windows."

2.9 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer

and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch-** thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.022-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.0022-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **40 foot-** long sections, sized in accordance with manufacturer's written instructions.

1. Gutter Supports: Fabricated from same material and finish as gutters. Spaced 36 inches o.c.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.018-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum **10-ft.-** long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters. Spaced 5 feet o.c.

G. Louvers: Size and design indicated; self-framing and self-flashing. Fabricate welded frames from zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.052-inch** nominal uncoated steel thickness; finished to match metal wall panels. Form blades from zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.040-inch** nominal uncoated steel thickness; folded or beaded at edges, set at an angle that excludes driving rains, and secured to frames by riveting or welding. Fabricate louvers with equal blade spacing to produce uniform appearance.

1. Blades:

    a. Fixed.

2. Free Area: Not less than 7.0 sq. ft. for **48-inch-** wide by **48-inch-** high louver.
3. Bird Screening: Galvanized steel, **1/2-inch-** square mesh, **0.041-inch** wire; with rewirable frames, removable and secured with clips; fabricated of same kind and form of metal and with same finish as louvers.

    a. Mounting: Interior face of louvers.

4. Vertical Mullions: Provide mullions at spacings recommended by manufacturer, or **72 inches** o.c., whichever is less.

H. Roof Curbs: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.052-inch** nominal uncoated steel thickness prepainted with coil coating; finished to match metal roof panels; with welded top box and bottom skirt, and integral full-length cricket; capable of withstanding loads of size and height indicated.

1. Curb Subframing: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.064-inch** nominal uncoated steel thickness, angle-, C-, or Z-shaped metallic-coated steel sheet.
2. Insulation: **2-inch-** thick, rigid type.

I. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to

base.

J. Snow Guards: Refer to Section "077253"

K. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
2. Fasteners for Metal Roof Panels:

    a. Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless steel cap or zinc-aluminum-alloy head and EPDM sealing washer.

3. Fasteners for Metal Wall Panels:

    a. Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with EPDM sealing washers bearing on weather side of metal panels.

4. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
5. Blind Fasteners: High-strength aluminum or stainless steel rivets.
6. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for **15-mil** dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
7. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
8. Metal Panel Sealants:

    a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
    b. Joint Sealant: ASTM C920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.10 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members to be free of cracks, tears,

and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
5. Shop Priming: Prepare surfaces for shop priming in accordance with SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming in accordance with SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.11 SOURCE QUALITY CONTROL

A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.

B. Testing: Test and inspect shop connections for metal buildings according to the following:

1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, shop-welded connections

shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

C. Product will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted in accordance with manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system in accordance with manufacturer's written instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal

building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, in accordance with AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.

    a. Joint Type: Snug tightened or pretensioned as required by manufacturer.
    b. Building manufacturer to provide torque requirements for high strength bolt connections.
    c. Contractor to coordinate with Owner’s employed third party testing agency confirming bolted connections are installed per metal building manufacturer’s recommendations.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction in accordance with SJI's "Standard Specifications, Load Tables, and Weight Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Joint Installation:

    a. Bolt joists to supporting steel framework using high-strength structural bolts unless otherwise indicated. Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for high-strength structural bolt installation and tightening requirements.

5. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 INSTALLATION OF METAL PANELS, GENERAL

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

C. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

    a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

D. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

E. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types used in tested assemblies meeting "Performance Requirements" Article.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 INSTALLATION OF METAL WALL PANELS

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.

3. When two rows of metal panels are required, lap panels **4 inches** minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.
9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer using sealants and gaskets as required for a watertight installation.

C. Insulated Metal Wall Panels: Install insulated metal wall panels on exterior side of girts. Attach panels to supports at each panel joint using concealed clip and fasteners at maximum **42 inches** o.c., spaced not more than manufacturer's written instruction. Fully engage tongue and groove of adjacent insulated metal wall panels. Refer to Section 074213.19 "Insulated Metal Wall Panels" for additional installation information.

1. Install clips to supports with self-tapping fasteners.
2. Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels as weather seal.

D. Installation Tolerances: Shim and align metal wall panels within installed tolerance of **1/4 inch in 20 ft**, noncumulative; level, plumb, and on location lines; and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.

3.6 INSTALLATION OF METAL SOFFIT PANELS

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.7 INSTALLATION OF DOORS AND FRAMES

A. See door schedule on drawings and other specification sections for man-door and overhead doors.

B. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place in accordance with manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

C. Personnel Doors and Frames: Install doors and frames in accordance with NAAMM-HMMA 840. Fit non-fire-rated doors accurately in their respective frames, with the following clearances:

1. Between Doors and Frames at Jambs and Head: **1/8 inch**.
2. Between Edges of Pairs of Doors: **1/8 inch**.
3. At Door Sills with Threshold: **3/8 inch**.
4. At Door Sills without Threshold: **3/4 inch**.

D. Door Hardware:

1. Install surface-mounted items after finishes have been completed at heights indicated in DHI's TDH-009.
2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
4. Set thresholds for exterior doors in full bed of sealant complying with requirements for concealed mastics specified in Section 079200 "Joint Sealants."

3.8 INSTALLATION OF WINDOWS

A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place in accordance with manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.

1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Set sill members in bed of sealant or with gaskets, for weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Mount screens directly to frames with tapped screw clips.

3.9 INSTALLATION OF ACCESSORIES

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 ft.** with no joints allowed within **24 inches** of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than **36 inches** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with **1-1/2-inch** telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch** away from walls; locate fasteners at top and bottom and at approximately **60 inches** o.c. in between.

1. Tie downspouts to underground drainage system indicated.

E. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.

1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
4. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply

with Section 079200 "Joint Sealants" for sealants applied during louver installation.

F. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

G. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.10 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Prepare test and inspection reports.

3.11 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

B. Door Hardware: Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every unit. Replace units that cannot be adjusted to operate as intended.

C. Windows: Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and at weather stripping to ensure smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.12 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Touchup Painting:

1. After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.

    a. Clean and prepare surfaces by SSPC-SP 2 or SSPC-SP 3.
    b. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished

surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

E. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.

1. Immediately before final inspection, remove protective wrappings from doors and frames.

F. Windows: Clean metal surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances. Clean factory-glazed glass immediately after installing windows.

G. Louvers: Clean exposed surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

1. Restore louvers damaged during installation and construction period so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

a. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 13 34 19

SECTION 14 45 10 - CRANES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Three ton bridge crane, including steel support framing.

B. One ton monorail crane, including steel support framing.

C. Extent and locations of equipment is indicated on the drawings and by provisions of this section.

1.2 RELATED REQUIREMENTS

A. Supporting structural steel for this work shall meet requirements of Section 05 12 00.

B. Division 09 Section “Painting”

C. Building structural steel frame is specified in specification Section 13 34 14.

D. Electrical power feed to this system is described under Division 26 Electrical Sections.

1.3 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Shall describe characteristic and specifications of manufactured item showing compliance with specifications.

C. Shop Drawing: Shall indicate lay and details or equipment showing construction and details pertinent to installation.

D. Supplier shall submit a list of local, recently installed similar monorail and crane installations to the Architect / Engineer.

E. Submit 1/4 inch to 1 foot scale shop drawings prior to fabrication. Provide structural steel supporting members designed by an Ohio Registered Engineer showing connection details.

F. Include construction details, sizes and layouts, accessories and components. Show clearances and indicate weight for building loading. Indicate dimensions and locations of items under this section together with relationships and methods of attachments to adjacent construction and height above floor.

G. Design Data: Indicate loads impose on structural system.

H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.

C. Design structural components under direct supervision of a Professional Engineer experienced in design of this Work and licensed at the place where the Project is located.

D. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.5 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Do not deliver to project site until dry storage space is provided

B. Deliver materials, components and equipment in manufacturer's protective packing

1.7 PROJECT CONDITIONS

A. Coordinate installation with size, location and installation of service utilities and structural components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Prohibited Use: Jib Crane shall not be used for any purpose during construction period before Substantial Completion.

1.8 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

A. Provide manufacturer's standard units, modified as necessary to comply with requirements. Shop fabricate each unit to the greatest extent possible. Provide structural steel members and install on steel rigid frame only. Do not support loads from roof purlins or girts. Provide sway bracing.

B. Runway beams shall meet or exceed the following minimum design criteria. Structural I- beams or wide flange beams or specially manufactured beams for monorail applications are permitted if they meet the following.

2.2 COMPONENT SUPPLIERS - MONORAIL AND BRIDGE CRANES

A. Subject to compliance with requirements, suppliers offering products, which may be incorporated in the work, include but are not limited to the following: ale, Cleveland Tramrail, Acco, Inc., R M, P H, Gorbel, Bushman, Spanco and Sheppard Niles.

2.3 COMPONENT SUPPLIERS - HOISTS

A. Subject to compliance with requirements, suppliers offering products, which may be incorporated in the work, include but are not limited to the following: ale, Cleveland Tramrail, Acco, Inc., R M, P H, Gorbel, Bushman, Spanco and Sheppard Niles.

2.4 MONORAIL HOIST

A. Capacity: 2000 live load, 16 4 FPM speed. Electric chain hoist and motorized trolley. Clearly identify load rating on the equipment, visible from the floor.

B. Location: As indicated on the Drawings.

C. Control: Integral independent push button unit for bridge, trolley and hoist control, 115V, NEMA type 12 enclosure supported by strain cable. Assembly to be lightweight, non-metallic, non- corrosive, non-conducting construction with drop to three feet from floor.

D. Trolley: 80 FPM variable speed. Provide unit with DC disk-type motor brakes, thermal overload relays and mainline disconnects.

E. Chain: Electro- inc plated load chain, 5-pocket load sprocket, provide sufficient length to reach the floor.

F. General: Ball or roller bearings. Oil bath/splash lubrication. H-4 duty class. Minimum 5:1 safety factor. Complies with HMI, NEC and ANSI.

G. Bottom Blocks: 360 degree hook rotation. Safety latch. ielding - fracture resistant hooks.

H. Gears: Case hardened. Drop forged or machine steel. Ductile iron gear case and aluminum gear case cover. Fabricated steel gear case.

I. Limit Switches: Provide upper and lower limit switch.

J. Hoist Motor: 1.34 HP., (208V/3P/30A) 230V/3P/60A, Class F insulation. 30 minute hoist duty rated with 75 C rise over 90 C ambient temperature. TENV Thermostats (208-3P) voltage - two speed.

K. Clearances: A minimum clearance of three inches should be provided between the hoist and any overhead obstruction and two inches for lateral obstructions.

L. Lift: Supply sufficient load chain to match height of system and reach floor.

M. Headroom: Identify hook height to the floor dimension.

2.5 BRIDGE CRANE

A. Capacity: 6000 live load, 20 3.3 FPM speed. Close headroom electric wire rope hoist and motorized trolley. Clearly identify load rating on the equipment, visible from the floor.

B. Coverage: As indicated on the Drawings.

C. Control: Radio Controlled integral push button unit 11 output relay (8A, 230V) 2 step push button for 3 movements (trolley, hoist and bridge controls) with two handheld transmitters and battery charger with spare battery. Assembly to be lightweight, non-metallic, non-corrosive, non-conducting construction with start / horn button, stop button, standby mode, hand strip and NiMH batteries or Standard off the shelf batteries may be used.

D. Bridge: 100 FPM variable speed. Provide unit with AC or DC motor brakes, thermal overload relays and mainline disconnects.

E. Trolley: 65 FPM variable speed. Provide unit with AC or DC motor brakes, thermal overload relays and mainline disconnects.

F. Wire Rope: Maximum duty and as appropriate for indicated capacity, sized to reach to floor.

G. General: Ball or roller bearings. Oil bath/splash lubrication. H-4 duty class. Minimum 5:1 safety factor. Complies with HMI, NEC and ANSI.

H. Mechanical or electrical hoist overload devises to assure maximum 100% rated capacity are not exceeded.

I. Bottom Blocks: 360 hook rotation. Safety latch. ielding - fracture resistant hooks.

J. Brakes: AC or DC disc type motor brake.

K. Controls: NEMA type 4/12 enclosures. Fused control circuit. 115 volt control circuit.

IEC contractors shall be sized properly for the required load.

L. Drum: Fabricated steel.

M. Gears: Case hardened. Drop forged or machine steel. Ductile iron gear case and aluminum gear case cover. Fabricated steel gear case.

N. Limit Switches: Provide both geared upper and lower limit switch shall be provided for hoist slow down prior to reaching upper limit and phase reversal protection at upper limit.

O. Hoist Motor: 3 HP., 208V/3P/60A, Class F insulation. 30 minute hoist duty rated with 75 C rise over 90 C ambient temperature. TENV Thermostats 208-3 voltage - two speed.

P. Clearances: A minimum clearance of three inches should be provided between the crane and any lateral or overhead obstruction and two inches for lateral obstruction.

Q. Lift: Supply sufficient wire rope to match height of system and reach floor.

R. Headroom: Provide close headroom hoist with notched bridgebeam for maximum hook height. Minimum hook height is 14 feet above the floor.

S. All hoist gear reductions must be in an oil tight gear case.

2.6 MONORAIL TRACK

A. Monorail track shall meet or exceed the following minimum design criteria. Structural I-beams or wide flange beams or specially manufactured beams for monorail applications are permitted if they meet the following.

1. Beam shall be designed to carry the proper loads throughout and meet AISE Standards.
2. Runways and monorails shall be designed to limit the deflection of 1/450 of the span but not to exceed 1-1/4 inch maximum deflection.
3. The ratio of span to top flange width shall not exceed 60 to 1.

2.7 SUSPENSION FITTINGS

A. Suspension fittings shall meet with the following minimum design criteria:

1. Direct bolt suspension is not acceptable. All suspension brackets shall be in the center of structural members.
2. All necessary clamps, hanger rods and other fittings from which a track is suspended should be considered as part of the track system. Track hangers shall support the load resulting from the maximum support load. The track shall be flexibly suspended and the suspension fittings shall support rods. System shall have a 1 inch minimum adjustment in the upper and lower connection to maintain a level system.
3. Sway bracing shall be provided on monorail and crane runway systems. The lateral braces shall be installed at each suspension point, but no further than 20

feet apart. All runways shall be longitudinally braced.

4. The braces shall keep sway within ANSI limits and shall not support any load. Braces shall be a bolted type. If rods cannot be used, use not less than 2 1/2 inch x 2 1/2 inch x 1/4 inch angle with end clips.
5. All hanger rods 3/4 inch diameter and larger shall be furnished with a roll form thread throughout their length. The allowable stress in the hanger rods shall not exceed 20 percent of the ultimate strength of the material used. Structural grade rod for supporting the system shall be used. Test results shall be furnished upon request.
6. On double-rod suspension, means must be provided to assure equalization of rod loading.
7. Web-type couplings shall also be used at all runway joints. The Maximum gap of the load carrying flange between spliced ends shall not exceed 1/16 inch.
8. Hanger rod nuts shall be furnished with set screws or other means to prevent nuts from backing off.
9. One side only of the crane runway must not be braced laterally and the support rods used will be a cone and cup design to allow movement up to 10 degrees for self alignment. Both sides of the runway will be braced longitudinally.

B. End Stops: Provide properly sized end stops at both ends of monorail and crane systems.

2.8 TROLLEYS

A. Trolley frame and wheels shall be removable anywhere on the track system without the necessity of removing a section of the track.

B. Trolley shall be a standard manufactures design.

C. Motor propelled trolleys shall be driven by a load bearing driving wheel mounted on with traction dependent on the wheel load of the driving heads.

1. The transmission of power from the motor to the drive wheels shall be by pinion gears to load bearing wheels.
2. Trolley to be furnished with a motor mounted, spring action, AC or DC motor brake
3. Lugs shall be provided on trolley frame to limit drop of the trolley to 1 inch or less in the event of wheel or axle failures. Lugs shall be located on both sides of the beam flange in front and back (four total) to provide central loading of the track about the vertical axis if failure occurs. Drop lugs shall be provided by the manufacture of the hoist.
4. When gear trains are utilized to obtain proper motor speed reduction, the following conditions shall be met:

    a. All gearing shall be of high quality hardened steel with precision machine cut teeth.
    b. All gear shafts shall be mounted on ball bearings.
    c. All gearing except the final reduction at the drive wheels shall be lubricated by an oil bath enclosed in an oil tight case.

5. The driven trolley shall have positive driven track wheels on both sides of the beam driven from a common pinion shaft.

D. Motor driven wheels shall be removable anywhere on the track system without the necessity of removing a section of the track.

1. Wheel bearings shall be double row, combination radial and thrust, anti-Friction precision type. Bearings must be provided with fittings and seals for pressure lubrication or permanently sealed.
2. Tapered wheels for S-beam type runways and flat tread wheels for wide flange runway beams are to be used
3. All wheels are to have flange wheels.

2.9 MONORAIL TROLLEY

A. Style: Single girder high headroom.

B. Drive: Provide built-in motorized trolley unit (0-80 F.P.M. variable seed) to match hoist.

C. Capacity: To match hoist.

D. Trolley to manufactured by the hoist provider and a standard designed part of the hoist frame.

E. Clearance: Identify all dimensions showing that the trolley is compact in vertical and horizontal directions.

F. Collectors: Trolleys hoist require appropriate current collectors for power and control voltages.

G. Lugs shall be provided on trolley frame to limit drop of the trolley to 1 inch or less in the event of wheel or axle failures. Lugs shall be located on both sides of the beam flange in front and back (four total) to provide central loading of the track about the vertical axis if failure occurs. Drop lugs must be provided by the manufacture of the hoist.

2.10 MONORAIL CONTROLS

A. Controls for the hoists, end trucks, and trolley drives are to be of sufficient capacity rating to allow continuous pushbutton jogging for smooth and precise load positioning.

B. Variable speed acceleration is required. VFD are to be properly rated and have overloads in all three phases. High voltage fusing is required. A mainline manual disconnect and pushbutton operated magnetic disconnect are required. NEMA 4/12 enclosures.

C. A positive ground wire must be utilized to the controls and tied into the ground conductor on the mainline electrification. Grounding through wheel contact will not be acceptable.

D. Finish: All track, suspension, bracing, etc. shall be factory primed and painted. One

factory coat white epoxy primer and field applied one epoxy field finish coat. The rail shall be cleaned by a power tool cleaning process prior to painting. Color selected by Architect / Engineer. Touch-up and touch-up painting of weld areas and painting of unpainted hanger rods is required by General Contractor.

2.11 UNDERHUNG BRIDGE CRANE

A. Under hung electric operated, high headroom, I-beam or W-Flange type bridge crane. Keep under clearance maximum to clear obstructions below.

B. Capacity: 6,000 lb. live load.

C. Coverage: As shown on the drawings. Crane design shall maximize hook coverage in all directions.

D. Class C duty rating.

E. Crane girders shall be designed in accordance with the provision of ANSI Section 2. The crane girder shall be designed to limit deflection to 1/600 of span and shall not exceed 1-1/4 inches maximum deflection.

1. Bridge span to the top flange ratio (runway centers divided by the width of top flange of bridge girder) shall not exceed 50:1 unless the top flange of the girder is braced.
2. On double girder cranes, means shall be provided to maintain the gauge for the full length of the girders.
3. Suitable safety stops shall be provided on crane girders to prevent a carrier from rolling off the end of the crane girder.
4. Standard manufactures end trucks must be used and designed to equalize the load over all the impacted wheels

F. End truck frames are to be welded steel construction, bolted vertically and rigidly to the bridge girder. All motor driven end trucks shall be provided with shear keys.

1. Lugs shall be provided on end trucks to limit drop of the end truck to 1 inch or less in the event of wheel or axle failures. Lugs shall be located on both sides of the tracks load carrying flange to provide central loading of the track about the vertical axis if failure occurs.
2. Manufactures standard end trucks designed for under hung bridges are to be utilized. End truck wheels shall comply with manufacture standard. End trucks are to be sized properly to carry all loading. Provided test approved safety lugs.
3. The ratio of crane span to end truck wheel base shall not exceed 7:1.
4. Motor propelled cranes shall be driven by individual pinion gears underneath the runway. A minimum of 4 wheels must be driven on the bridge crane.
5. Drives: Individual load bearing type using spur gearing in oil or grease bath are required with dual wheel drive per each end truck. Motor must be flange mounted directly to a sealed gearbox without coupling or belt drive.

2.12 BRAKES

A. Hoist brakes shall be in accordance with Hoist Manufactures Institute Specification and ANSI B30.16 Safety Code for Overhead Hoists.

B. Bridge and carrier brakes, when specified, shall be designed to mount on the drive motor shaft or fist reduction in the gear train. When brakes are supplied, they will be operated electrically. They shall have a torque rating of at least 100 percent of the rated motor torque and shall provide a smooth deceleration.

C. Brakes shall be provided with adjustments for torque, and to compensate for wear.

2.13 ELECTRICAL CONTROLS

A. Types:

1. Crane bridge and carrier travel control system shall be of the magnetic type.
2. Provide IEC or NEMA rated controls. Provide on-off buttons located on the pendant. Main line power disconnect is provided by electrical contractor.
3. A positive ground must be utilized on all electrical controls and tied into the ground leg of the mainline electrification. Grounding through wheel contact will not be acceptable

B. Enclosures:

1. All control enclosures shall conform to NEMA 4/12 standard.

C. Wiring:

1. Control wiring shall comply with the provision of Article 610 (ANSI CI) National Electric Code current edition.

D. Voltage-Operating:

1. The power voltage shall be 208 volts alternating current three phases.
2. The operating voltage at pushbuttons shall not exceed 120 volts for alternating current.

E. Crane Control:

1. Pendant - unless otherwise specified all functions on floor operated equipment shall be from a common pendant push button station supported in a manner that will satisfactorily protect the multiple conductor electrical cable against strain. Pendant control boxes shall be constructed to prevent electrical shock and be clearly marked for identification of functions. Control motion push buttons shall return to the “off” position when pressure is released by the operator.

F. Protection:

1. Motor running over current protection shall be provided by thermal overloads located in the controls.

2. Where more than one operates a single carrier or crane and is controlled as a unit by one controller, their leads may be protected by a single over current device.
3. Branch circuit fuse protection shall be provided.
4. A positive ground must be utilized on all electrical controls and tied into the ground leg of the mainline electrification. Grounding through wheel contact will not be acceptable
5. A motor-circuit switch or circuit breaker should be provided in the leads from the runway contact conductors on all powered cranes. A bridge mainline contractor should be provided operable from the crane operating station to disconnect the power to the crane system.

G. Design Requirements:

1. Magnetic control shall have contractors of sufficient size for crane and hoist duty consistent with the horsepower and voltage of the motor(s) as defined by (ANSI CI) National Electric Code.
2. Solid state power components and static power components such as Rectifiers, reactors, etc. Shall be rated in accordance with the horsepower, voltage and time ratings of the motor or motors with which they are used.
3. Systems shall function so that if the control signal for any motion becomes ineffective that motion will stop. System operation must include a manual “Reset” function in order to fully activate motions.
4. The control for the bridge and trolley travel shall be so located that the operator can readily face the direction of travel.
5. Each control element shall clearly indicate the direction of resultant motion.
6. All reversing contractors shall be mechanically and/or electrically interlocked.
7. The continuous ampere capacity of the motor circuit switch or circuit breaker shall be not less than 50 percent of the combined short-time ampere requirements of the motor required for any single crane operation.

H. Electrification

1. Where electrical equipment is used on a system, power shall be supplied by means of enclosed and insulated conductor bar. The conductors shall be mounted parallel to the track throughout its entire length. Conductors shall be firmly coupled mechanically and electrically in the entire system. A separate conductor shall be provided for each phase. System to include a green leg for ground. Each enclosed conductor bar shall be steel and shrouded on three sides for its entire length. Each enclosed conductor and its covering shall be supported and insulated from the others and also from the ground by use of insulating supports. Each enclosed conductor shall have a minimum continuous current carrying capacity of 90 amperes. The enclosed conductor system shall be approved by the :Underwriter’s” Laboratories, Inc.” Rolled galvanized steel channel-type construction is required to hold the collector shoes in place. Figure-eight type is not permitted.
2. The main power current collectors shall be sliding shoe type, making positive continuous contact with the three surfaces of each conductor. This positive contact shall not be dependent upon gravity. The shoe shall be made of graphite impregnated powered bronze for extended life. The collectors shall make contact with the bar form the underside so that foreign particle entry on the slipping

surfaces is minimum. Each current collector shall have a minimum rating of 50 amperes. Two current collector shoes to be supplied per each independent run (each phase) and ground leg.

I. Testing

1. All testing Per ASME B30.2 shall be in compliance with all applicable codes to include initial start-up. Documented initial inspection and documented proof load test shall be done in the field and with a designated representative from Architect / Engineer present. All documents along with all maintenance manuals for the monorail and bridge crane system must be delivered to the designated ODOT representative within 10 days of completion of the testing.

J. Painting:

1. Finish: The rails shall be cleaned by a power tool cleaning process prior to painting. All track, suspension, bracing, etc. shall be factory painted with one coat of epoxy primer. One finish coat of epoxy special coating shall be field applied. Finish coat, touch-uppainting and touch-up painting of weld areas and painting of unpainted hanger rods shall be by General Contractor.
2. Epoxy paint shall be crane and/or hoist manufacturer’s standard.

PART 3 - EXECUTION

3.1 PREPARATION

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication of special components when possible, to ensure proper fitting of work. Allow for adjustment and fitting wherever taking of field measurements before fabrication will delay work.

3.2 FABRICATION

A. Fabrication of the monorail and crane systems shall be done with quality workmanship in the proper codes for this type of work.

B. All holes shall be punched or drilled before shipment to the job site. All edges shall be smooth. Avoid ragged cuts. Field torched holes or cutoffs shall not be permitted.

C. The crane bridge shall be shipped to the site completely assembled and shop tested. There are no exceptions to this requirement.

3.3 QUALIFICATIONS

A. Monorail supplier shall utilize all reasonable knowledge, skill and experience to provide a safe crane, which operates smoothly and is easily maintained.

B. Supplier shall show that they stock complete repair parts for all components offered.

3.4 INSTALLATION

A. Install complete operating monorails, trolleys, hoists, attachments and accessories necessary and required for the monorail systems. Verify that all connections will not fail or release load under sustained loads and operating conditions.

B. The manufacturer shall provide a factory trained service representative to inspect and demonstrate proper use of the equipment to the Owner's personnel prior to Contract completion. All power to the equipment must be fully operational.

3.5 WARRANTY, MANUAL AND DRAWINGS

A. Submit complete "as-built" drawings of crane and monorails and installation details for project closeout. Submit two complete sets of service, parts and instruction manuals is a three ring binder for all monorail components furnished. Provide a one year warranty for all parts and installation.

END OF SECTION 14 45 10