

**DEPARTMENT OF PUBLIC WORKS**

**DIVISION OF CIVIL ENGINEERING**

**INVITATION TO BID**

**SPLASH PAD RENOVATIONS**  
**(3% MBE PARTICIPATION GOAL)**  
**(DAYTON RECOVERY PLAN FUNDS)**

Electronic bids will be received by the Director, Department of Public Works, City of Dayton, Ohio until 12:00 o'clock NOON, Dayton time, **THURSDAY, JUNE 4, 2026** for the following improvement in accord with the bidding documents available for download at [www.questcdn.com](http://www.questcdn.com) using the QuestCDN eBidDoc Number for this project **#10183155**. Bids will **ONLY** be received and accepted via the online electronic bid service through [www.QuestCDN.com](http://www.QuestCDN.com). Bid results will be published and can be viewed on the QuestCDN project page using the project number listed above, shortly after the bids are received.

**If the base bid plus all alternates accepted by the City for this Project exceeds \$2,000,000.00, the successful contractor, and all of its subcontractors, will be required to enter into a Project Labor Agreement pursuant to the terms of Dayton R.C.G.O. Section 35.241.**

Minority Business Enterprise (MBE) subcontract bidders on this project must be certified with the City of Dayton Human Relations Council as such.

**The City of Dayton encourages all bidders to review the list of certified companies in our Procurement Enhancement Program at <https://citybots.com/Home/Links> (click the “Certification List” link under Procurement Enhancement Program). This Project is being bid with a 3% MBE participation goal. A company must be certified as MBE for the MBE goal at the time of the bid opening and must be pre-qualified to perform the proposed subcontracted work. You are advised to obtain a copy of the company’s certification letter and to review the Certification List. The participation must be submitted with your bid on the “PEP-Certified MBE Participation Form (for the MBE goal)” provided by the City of Dayton Human Relations Council (HRC). Participation Forms must be completely filled out in accordance with the instructions listed on the forms. Any total or partial request for waiver of the MBE goal must be submitted on the enclosed “PEP Participation Commitment and/or Waiver Request Form.”**

**CHANGES TO THE BID EVALUATION PROCESS**

**Each Bidder must submit an executed “PEP Participation Commitment and/or Waiver Request Form” to summarize the Bidder’s overall PEP participation plan and/or to request a full or partial waiver of a PEP participation goal. For each PEP firm whose participation is being counted toward a goal, a Bidder must also submit one (1) executed “PEP-Certified SBE/MBE/WBE/DLSB Participation Form” describing the PEP firm’s participation on the Base Bid and on Alternates. Participation will be evaluated based on the Base Bid plus Alternates as selected by the awarding department.**

**If unable to meet the project’s PEP participation goal(s), a Bidder must submit a waiver request with its Bid. A Bidder must maintain supporting documentation of its Good Faith Efforts to meet the participation goal(s). If requesting a waiver, documentation of Good Faith Efforts must be submitted to the HRC within two (2) business days of the Bid Opening date. Bidders will receive no further reminders about this deadline.**

**A waiver will be granted based on a Bidder’s Good Faith Efforts, and only when the HRC determines that a Bidder has completed all of the following activities:**

- 1. Solicited the interest of all PEP-Certified Firms having the capability to perform the work of the contract. The Bidder must solicit this interest at least ten (10) business days before the Bid Opening Date in order to allow the**

PEP-Certified Firm sufficient time to respond to the solicitation. Electronic communication will not be deemed as sufficient Good Faith Efforts, if it is the sole method of communication used.

2. Divided contract work items into economically feasible units to facilitate PEP participation, even when the Bidder/Proposer might otherwise prefer to perform these work items with its own forces.
3. Negotiated in good faith with PEP-Certified Firms and considered the firms' prices and capabilities as well as the contract goals. Rejected PEP-Certified Firms as being unqualified only for reasons based on a diligent investigation of their capabilities. The Bidder's standing within its industry; membership in specific groups, organizations, or associations; and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes to reject or not solicit bids from particular PEP-Certified Firms.
4. Provided interested PEP-Certified Firms with plans and specifications at no cost, or directed them to the Greater Dayton Minority Business Assistance Center (Dayton MBAC) for information about the project's plans, specifications, and requirements at least ten (10) business days prior to the Bid Opening Date in order to assist them in responding to a solicitation.
5. Sought the Dayton MBAC's assistance or used the services of community organizations; contractors' groups; local, state or federal business assistance offices; or similar organizations to find PEP-Certified Firms. Contacting the HRC for a list of certified companies will not be deemed as sufficient Good Faith Efforts.

**NOTE:** In determining whether a Bidder has made Good Faith Efforts, the HRC may take into account the performance of other Bidders in meeting the goal(s). For example, when the apparent low bidder fails to meet a participation goal but others meet it, the HRC may reasonably raise the question of whether, with additional reasonable efforts, the apparent low bidder could have met the goal.

If you have questions regarding PEP participation or the waiver request process, please contact the Human Relations Council at (937) 333-1403.

**Description of Improvement**

This project will renovate and modernize features at six splash pads within the city of Dayton. Work will include the removal and replacement of splash pad features and equipment. Minor concrete slab removal and replacement may be required at these locations. For three other parks, new splash pads will be constructed in which existing pads do not exist. Work for these sites includes excavation, subgrade preparation, running of electric and plumbing, placement of concrete slab, and installation of splash pad features. This work, and other work considered incidental to this project, is more described in the project documents.

**Location**

**SPLASH PAD RENOVATIONS**  
**(3% MBE PARTICIPATION GOAL)**  
**(DAYTON RECOVERY PLAN FUNDS)**

**Completion Date**

May 15, 2027

**CHARGE FOR PLANS & SPECIFICATIONS: \$70.00**  
**(NON-REFUNDABLE)**

**LEGAL NOTICE NO. 30**

Electronic bids will be received by the Director of Public Works of the City of Dayton, State of Ohio, until 12:00 Noon, **THURSDAY, JUNE 4, 2026** for the following improvement:

**SPLASH PAD RENOVATIONS**  
**(3% MBE PARTICIPATION GOAL)**  
**(DAYTON RECOVERY PLAN FUNDS)**

Information and instructions to bidders may be obtained at the City Engineer's Office Prospective bidders must be on the plan holders list through QuestCDN for bids to be accepted. Bidding documents for this project may be examined online or downloaded at: [www.questcdn.com](http://www.questcdn.com). The QuestCDN eBidDoc Number for this project is #10183155. There is a non-refundable fee of \$70 for each set of bidding documents.

**If the base bid plus all alternates accepted by the City for this Project exceeds \$2,000,000.00, the successful contractor, and all of its subcontractors, will be required to enter into a Project Labor Agreement pursuant to the terms of Dayton R.C.G.O. Section 35.241.**

Minority Business Enterprise (MBE) subcontract bidders on this project must be certified with the City of Dayton Human Relations Council as such.

**The City of Dayton encourages all bidders to review the list of certified companies in our Procurement Enhancement Program <https://citybots.com/Home/Links> (click the "Certification List" link under Procurement Enhancement Program). This Project is being bid with a 3% MBE participation goal. A company must be certified as MBE for the MBE goal at the time of the bid opening and must be pre-qualified to perform the proposed subcontracted work. You are advised to obtain a copy of the company's certification letter and to review the Certification List. The participation must be submitted with your bid on the "PEP-Certified MBE Participation Form (for the MBE goal)" provided by the City of Dayton Human Relations Council (HRC). Participation Forms must be completely filled out in accordance with the instructions listed on the forms. Any total or partial request for waiver of the MBE goal must be submitted on the enclosed "PEP Participation Commitment and/or Waiver Request Form."**

**Thomas Ritchie, Jr., Director  
Department of Public Works**

**Published in the Dayton Daily News on May 11, 2026 and May 18, 2026.**

## INSTRUCTIONS

Instructions for submitting a Bid are contained in the Invitation to Bid; the City of Dayton Construction and Material Specifications dated October 1, 2008, sections 103.01-103.43 and related modifications; the Amendments to the City of Dayton General Provisions; and any Addendum.

Electronic bids for the **SPLASH PAD RENOVATIONS (3% MBE PARTICIPATION GOAL) (DAYTON RECOVERY PLAN FUNDS)** project will be received by the Director, Department of Public Works, until 12:00 o'clock NOON, Dayton time, on **THURSDAY, JUNE 4, 2026**. Each bid shall be submitted using the QuestCDN vBid portal. Bidders must download the project bid document file from QuestCDN, which will add Bidders to the plan holders list and give Bidders access to vBid Online Bidding. No paper bids will be accepted for this project. There is a non-refundable fee of \$70 to download the bid package and submit an electronic bid. Minority Business Enterprise (MBE) subcontract bidders on this project must be certified with the City of Dayton Human Relations Council as such.

**If the base bid plus all alternates accepted by the City for this Project exceeds \$2,000,000.00, the successful contractor, and all of its subcontractors, will be required to enter into a Project Labor Agreement pursuant to the terms of Dayton R.C.G.O. Section 35.241.**

The City of Dayton encourages all bidders to review the list of certified companies in our Procurement Enhancement Program at <https://citybots.com/Home/Links> (click the "Certification List" link under Procurement Enhancement Program). This Project is being bid with a 3% MBE participation goal. A company must be certified as MBE for the MBE goal at the time of the bid opening and must be pre-qualified to perform the proposed subcontracted work. You are advised to obtain a copy of the company's certification letter and to review the Certification List. The participation must be submitted with your bid on the "PEP-Certified MBE Participation Form (for the MBE goal)" provided by the City of Dayton Human Relations Council (HRC). Participation Forms must be completely filled out in accordance with the instructions listed on the forms. Any total or partial request for waiver of the MBE goal must be submitted on the enclosed "PEP Participation Commitment and/or Waiver Request Form."

## CHANGES TO THE BID EVALUATION PROCESS

Each Bidder must submit an executed "PEP Participation Commitment and/or Waiver Request Form" to summarize the Bidder's overall PEP participation plan and/or to request a full or partial waiver of a PEP participation goal. For each PEP firm whose participation is being counted toward a goal, a Bidder must also submit one (1) executed "PEP-Certified SBE/MBE/WBE/DLSB Participation Form" describing the PEP firm's participation on the Base Bid and on Alternates. Participation will be evaluated based on the Base Bid plus Alternates as selected by the awarding department.

If unable to meet the project's PEP participation goal(s), a Bidder must submit a waiver request with its Bid. A Bidder must maintain supporting documentation of its Good Faith Efforts to meet the participation goal(s). If requesting a waiver, documentation of Good Faith Efforts must be submitted to the HRC within two (2) business days of the Bid Opening date. Bidders will receive no further reminders about this deadline.

The time of completion is May 15, 2027.

Please direct all technical questions to:

Andrew Marks  
Department of Public Works  
Phone (937) 333-4010  
E-mail [andrew.marks@daytonohio.gov](mailto:andrew.marks@daytonohio.gov)

Each Bid shall be accompanied by a bond executed by a surety company authorized to do business in the State of Ohio for an amount of **at least ten percent (10%) of the amount of the bid submitted, including Alternates**, as a guarantee that if the bid is accepted, a Contract will be entered into and its performance properly secured.

**NOTE: THIS PROJECT IS STATE OF OHIO SALES TAX EXEMPT  
THIS PROJECT IS STATE PREVAILING WAGE**

## **CITY OF DAYTON CMS MODIFICATIONS FOR ONLINE BIDDING**

The City of Dayton Construction and Material Specifications are hereby modified by this Contract as follows:

### **100 GENERAL PROVISIONS**

#### **ITEM 101 ABBREVIATIONS**

**101 Abbreviations.** The following abbreviations, when used in the Contract Documents, shall have the respective meaning shown below:

ANLA	American Nursery and Landscape Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWG	American Wire Gauge
AWP	American Wood Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
CMS	Construction and Material Specifications of the Ohio Department of Transportation
DCE	District Construction Engineer
DDD	District Deputy Director
DET	District Engineer of Tests
DMA	Declaration Regarding Material Assistance/Non-Assistance to a Terrorist Organization
DNR	Department of Natural Resources
EEI	Edison Electric Institute
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration, Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration
HRC	The Human Relations Council of the City of Dayton
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IMSA	International Municipal Signal Association
IPCEA	Insulated Power Cable Engineers Association
ISSA	International Slurry Seal Association
ITE	Institute of Transportation Engineers
JMF	Job Mix Formula
MSDS	Material Safety Data Sheet(s)

NCHRP National Cooperative Highway Research Program  
NEMA National Electrical Manufacturers Association  
NISTN National Institute of Standards and Technology  
NPDES National Pollutant Discharge Elimination System  
OAC Ohio Administrative Code  
ODOT Ohio Department of Transportation  
OMUTCD Ohio Manual of Uniform Traffic Control Devices  
ORC Ohio Revised Code  
ORDC Ohio Rail Development Commission  
OSHA Occupational Safety and Health Administration  
PCC Portland Cement Concrete  
RCGO City of Dayton Revised Code of General Ordinances  
REA Rural Electrification Administration  
SSP Steel Structures Painting Council  
STAR State Treasurer's Asset Reserve  
UL Underwriters' Laboratories, Inc.

## ITEM 102 DEFINITIONS

**102 Definitions.** The following words or terms, when used in the Contract Documents, are defined to mean as follows:

**Addendum or Addenda** A written or graphic instruction issued prior to the Bid Deadline which clarifies, amends or interprets the Contract Documents.

**Alternate** A proposed change in the work described in the Contract Documents providing the City with an option to select between alternative materials, products or systems, or to add or delete portions of the Work.

**Alternative Dispute Resolution** A method of resolving disputes other than arbitration or litigation.

**Approved Equal** Article, device, material, Equipment, form of construction or other item proposed by the Bidder and approved by the Engineer for incorporation or use in the Work as being equivalent to essential attributes of a standard specified in the Contract Documents.

**As-built Drawings** Drawings or computer files revised and submitted by the Contractor to show changes made during the construction process.

**Authorized Representative** Unless otherwise specified in the Contract Documents, the City Manager of the City or any of the City Manager's duly authorized assistants or designees.

**Base Bid** The amount of money stated in a Bid as the sum for which the Bidder offers to perform the Work described in the Contract Documents, exclusive of adjustments for Alternates.

**Bid** The offer of a Bidder to perform the Work for the amount or amounts quoted, as applicable.

**Bidder** A Person who submits a Bid for a Contract with the City.

**Bid Deadline** The date and time established as the deadline for submission of Bids, either through the Electronic Bidding Service or as otherwise provided by the City, subject to modification by Addendum.

**Bid Guaranty** Bid Bond or other instrument of security furnished by the Bidder to provide assurance that the Bidder will execute the Contract Form.

**Board of Review** Committee consisting of the City Manager, City Attorney and Director of the Department of Public Works or any of their respective authorized assistants or designees.

**Borrow Area** A location from which natural materials are to be removed for use in the Work.

**Bridge** A Structure, including supports, erected over a depression or an obstruction, as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads and having a length measured along the center of the roadway of more than 10 feet between undercopings of abutments or extreme limits of openings for multiple boxes.

*Length.* The length of a Bridge Structure is the over all length measured along the center line of Roadway of the surface of the Roadway.

*Roadway width.* The clear width measured at right angles to the longitudinal centerline of the Bridge between the bottom of curbs or guard timbers or, in the case of multiple heights of curbs, between the bottoms of the lower risers. For curb widths of 1 foot or less, the Roadway width shall be measured between the parapets or railings.

**Building Department** The City's Department of Building Services.

**Bulletin** A document issued by the Engineer after the execution of the Contract Form requesting a Proposal from the Contractor which, if approved as provided in the Contract Documents, will cause the execution of a Change Order to modify, amend or alter the Contract Documents. The Bulletin becomes a part of the Contract Documents when a Change Order related to the Bulletin is executed by all applicable Persons.

**Certificate of Contract Completion** A document signed by the Contractor and the Engineer certifying that Contract Completion has occurred.

**Certificate of Partial Occupancy or Use** A document signed by the Contractor and the Engineer certifying that City has chosen to occupy or utilize the Project or a designated portion thereof in accordance with 105.03.

**Certified Test Data** A test report from a manufacturer's Laboratory or an independent Laboratory approved by the City listing actual test results of samples tested for compliance with specified City requirements. The City will accept Certified Test Data from a manufacturer's Laboratory if its products have been used satisfactorily on prior City Contracts and its test data has been confirmed. The Contractor shall include a statement that the test data furnished is representative of the material furnished to a City Project or to a supplier. The report shall contain a characteristic number or date and shall identify the City Project or supplier to which the material is shipped. All reports shall be signed by an individual having legal authority to act for the manufacturer's Laboratory or independent Laboratory, as applicable.

**Change Order** A document issued by the City after execution of the Contract Form, which authorizes a change in the Work or an adjustment or alteration in the Contract price or the time for Contract Completion. A Change Order which requires only use of contingency funds (a "Field Change Order") may be approved by the Engineer. A Change Order which increases the Contract price must be approved by the City Manager and/or City Commission.

**City** The City of Dayton, an Ohio municipal corporation.

**Claim Affidavit** A sworn document containing a claim on funds that are due to a Contractor, created by statute in favor of a Person supplying labor, materials or services for the value of labor, materials or services supplied.

**Conduit** Any pipe or similar passageway for electricity, gas, water, Sewer or other utility.

**Construction Schedule** The schedule for the construction of the Work showing the time for completion of the Work, the planned sequence for performing the Work, the Contractor's resource loading curve and the interrelationship of the Contractor's activities with the activities of other Contractors, if any, the Engineer, and the City.

**Contingency Fund** Moneys reserved by the City within the contract to pay costs resulting from Change Orders, unanticipated conditions, compliance with rulings on building or other codes, incompleteness or inaccuracy of Contract Documents and settlements on judgments related to the Project.

**Contract** The agreement between the City and the Contractor as set forth in the Contract Documents.

**Contract Bond** Performance and payment bond or bonds, as applicable, furnished by the Contractor and the Contractor's Surety to provide assurance that the Contractor will perform the Contract and make required payments.

**Contract Completion** The date upon which all deficiencies noted in the Punch List have been corrected, the Contractor's Work is one hundred percent complete, the as-built drawings have been approved by the Engineer, and the Contractor has complied with all conditions precedent to final payment and release of retainage. When the Contract Documents specify a date for Contract Completion, Contract Completion shall occur on or before the specified date, even if the specified date is a Saturday, Sunday or legal holiday. When the Contract Documents provide that Final Acceptance shall occur a specified number of consecutive days after the date for commencement of Work set forth in the Notice to Proceed, that period of time shall be the time for Contract Completion.

**Contract Cost Breakdown** A statement furnished by the Contractor to the City reflecting the portions of the Contract price allocated to the various portions of the Work and used as the basis for reviewing the Contractor's Payment Requests.

**Contract Documents** Collectively, the Plans, plan notes, standard construction Drawings identified in Plans, Specifications, supplemental Specifications, Addenda, definitions,

Legal Notice, instructions to Bidders, equal opportunity requirements, electronic Bid, Bidder's affidavit, non-collusion affidavit, Bid guaranty, Substitution sheet, Contract Form, Contract Bond or Bonds, as applicable, wage rates and Special Provisions, Change Orders and approved Working Drawings, if any.

**Contract Form** The form furnished by the City that, when completed and signed by the Contractor and the City, evidences the entry into the Contract.

**Contractor** A Person with whom the City has entered into a Contract for the performance of Work on the Project in cooperation with other Persons and in accordance with the Contract Documents.

**Culvert** Any Structure not classified as a Bridge that provides an opening under a Roadway.

**Day** Calendar day, i.e., every day of the year, unless otherwise expressly specified to mean a business day. A business day is any day other than a Saturday, Sunday or legal holiday.

**Defective** When modifying the word Work, refers to Work that does not conform to the Contract Documents, or does not meet the requirements of any applicable statute, rule or regulation, policy, inspection, reference standard, test or approval, or has been damaged prior to Final Acceptance, unless responsibility for the protection thereof has been expressly assumed by the City, or that is not free from defects in workmanship, material or Equipment during the period of a Guarantee.

**Director** The Director of the City Department under which the Project is being performed, or the duly authorized designee of the applicable Director.

**Drawings** See Plans.

**Electronic Bidding Service** The electronic service used by the City to disseminate bidding information and documents to Bidders and to receive Bids and related documents from Bidders.

**Engineer** Unless otherwise specified in the Contract Documents, the Engineer of the Department of Public Works, the Water Engineering Manager of the Department of Water of the City of Dayton or the Planning and Engineering Manager of the Department of Aviation under which the Project is being performed, or the duly authorized designee of the Engineer or Manager, as applicable.

**Engineer's Estimate** An estimate of cost for a Project or a Contract for a Project prepared by the Engineer prior to Bid Deadline.

**Equipment** All machinery and Equipment, together with the necessary supplies for upkeep and maintenance, tools and apparatus necessary for the construction of the Work.

**Fabricator** The Subcontractor that fabricates structural metals or prestressed concrete members.

**Final Acceptance** The City's acceptance of the Work from the Contractor upon approval by the Authorized Representative of the Certificate of Contract Completion.

**Final Inspection** Final review of the Work of the Contractor by the Engineer to determine whether certification of Contract Completion is appropriate.

**Guarantee** Legally enforceable assurance, for a period after Contract Completion, of quality or performance of the Contractor's workmanship, material and Equipment.

**Inspector** A Person assigned by the Engineer to make detailed inspections of the Work.

**Laboratory** The testing Laboratory designated by the City or determined in accordance with the Contract Documents.

**Legal Notice** The public announcement inviting Bids for Work.

**Liquidated Damages** The sum established in the Contract Documents as the predetermined measure of damages to be paid to the City due to the Contractor's failure to complete the Work, or portions thereof, within a stipulated time.

**Maintenance Bond** A bond furnished by the Contractor and the Contractor's Surety to provide assurance that the Contractor will perform the Guarantee.

**Materials** Any substances, supplies, products or other items specified or reasonably intended for use in the construction of the Project and its appurtenances.

**Material Supplier** A Person who furnishes materials for Work on the Project, in any tier.

**Mathematically Unbalanced** The lump sum amount or Unit Price in a Bid that does not include reasonably sufficient amounts for labor, material, Equipment, overhead and other applicable costs and profit.

**Notice of Commencement** The notice prepared by the City identifying the Project, the Contractor, the Surety for the Contractor and the name of the Person upon whom a Claim Affidavit may be served.

**Notice of Intent to Award** The notice provided to the apparently successful Bidder stating that upon satisfactory compliance with all conditions precedent for execution of the Contract Form, within the time specified, the City intends to execute a Contract Form with the Bidder.

**Notice to Proceed** A notice provided by the Engineer to the Contractor authorizing the Contractor to proceed with the Work and establishing the date for commencement of the Work.

**Or Equal** See Approved Equal.

**Owner** See City.

**Partial Occupancy or Use** The stage in the progress of the Work when the Project, or a designated portion thereof, is sufficiently complete in accordance with the Contract Documents so the City can occupy or utilize the Project, or the designated portion thereof, for its intended use, if the City chooses.

**Payment Request** The form furnished by the City that is to be used by the Contractor in requesting progress payments and which when signed by the Contractor shall serve as an affidavit that payment requests are in proportion to the Work completed as shown by the Contract Cost Breakdown and that payments previously paid by the City have been applied by the Contractor to discharge in full all of Contractor's obligations incurred in connection with the Work covered by all prior Payment Requests.

**Pedestrian Bridge** A Bridge designed and constructed to provide means of traverse for pedestrian traffic only; also known as a foot Bridge.

**Permittee** Any Person issued a permit by the City to perform Work in accordance with these Specifications in a street, alley, Public Way or place, but not having a Contract with the City.

**Person** An individual, corporation, business trust, estate, limited liability company, partnership, association or other entity, public or private.

**Plans** The graphic and pictorial portions of the Contract Documents, showing the design, type of construction, location, dimension and character of the Work to be provided by the Contractor, generally including Drawings, elevations, sections, details, schedules, diagrams, notes, and Specifications, in whole or in part.

**Profile Grade** The trace of a vertical plane intersecting the top surface of the proposed wearing surface, usually along the longitudinal center line of a Roadbed. Profile Grade means either elevation or gradient of such trace according to the context.

**Project** The improvement to be constructed, of which the Work performed under the Contract Documents may be the whole or a part.

**Project Schedule** The schedule for the construction of the Project showing the time for completing the Work, the planned sequence for performing the Work, the Contractor's resource loading curve and the interrelationship between the activities of the Contractor, other Contractors, the Engineer, and the City.

**Proposal** The offer of the Contractor to complete the Work set forth in a Bulletin.

**Proposed Equal** Article, device, material, Equipment, form of construction or other item proposed by the Bidder for incorporation or use in the Work as being equivalent to essential attributes of a standard specified in the Contract Documents.

**Public Way (or Place)** A street, road, walk, alley or path used for public travel.

**Punch List** A list of items of Work to be completed or corrected by the Contractor as a condition precedent to Contract Completion.

**Record Drawings** Drawings or computer files revised by the Engineer to show the changes made during the construction process, based on the As-built Drawings furnished by the Contractor to the Engineer.

**Request for Information** Written request from the Contractor to the Engineer seeking an interpretation or clarification of the Contract Documents.

**Right-of-Way** Land, property, or interest therein, usually in a strip, acquired for or devoted to a road and includes the Roadway, Shoulders or berm, ditch and slopes extending to the Right-of-Way limits under control of the City.

**Road** A Public Way for purposes of vehicular travel, including the entire area within the Right-of-Way.

**Roadbed** The graded portion of a road within top and side slopes, prepared as foundation for the pavement Structure and Shoulder.

**Roadside** The areas between the outside edges of the Shoulders and Right-of-Way boundaries. Unpaved median areas between inside Shoulders of divided highways and infield areas of interchanges are included.

**Roadside Development** Those items necessary to the complete road that provide for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers; such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the road.

**Roadway** The portion of a road within the limits of construction.

**Samples** Physical examples furnished by the Contractor to illustrate materials, Equipment or workmanship and to establish criteria by which the Work will be judged.

**Schedule of Values** See Contract Cost Breakdown.

**Sewer** Pipe or Conduit intended for carrying storm drainage or sanitary drainage.

**Shop Drawings** Drawings, diagrams, illustrations, schedules, performance charts, brochures, catalog data and other data specially prepared or provided by the Contractor, a Subcontractor or Material Supplier to illustrate some portion of the Work.

**Shoulder** The portion of the road contiguous to the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

**Sidewalk** That portion of the road constructed for the use by pedestrians.

**Special Provisions** Amendments to the Specifications or supplemental Specifications, which describe conditions unique to a particular Project.

**Specifications** Those portions of the Contract Documents consisting of the detailed written requirements and standards for materials, Equipment, construction systems and workmanship as applied to the Work and certain procedural details applicable thereto.

**Standards** The items named in the Specifications to denote kind, quality or performance requirement for the Work. All Bids and Proposals shall be based on the Standards as set forth in the Specifications.

**State** The State of Ohio.

**Street** See road.

**Structure** Bridge, Culvert, catch basin, curb inlet, drop inlet, retaining wall, cribbing, manhole, endwall, building, curb, pavement, Sewer, water main, service pipe, underdrain, foundation drain, and any other features which may be encountered in the Work and not otherwise defined herein.

**Subcontractor** A Person who undertakes to perform any part of the Work on the Project under a Contract with any Person other than the City, in any tier.

**Subgrade** The portion of a Roadbed upon which the pavement structure and Shoulders are constructed.

**Substitution** An item proposed by the Bidder to be used instead of a standard, but not considered in determining the lowest and best Bidder.

**Substructure** The part of a structure below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, together with backwalls and wings.

**Superintendent** The Contractor's Authorized Representative in charge of the Work.

**Superstructure** The entire structure except the Substructure.

**Supplemental Specifications** Detailed Specifications supplemental to or amending or superseding the Specifications.

**Surety** A Person providing a Bid guaranty, Contract Bond or Maintenance Bond to a Bidder or Contractor, as applicable, to indemnify the City against all direct and consequential damages suffered by failure of the Bidder to execute the Contract Form or of the Contractor to perform the Contract and to pay all lawful claims of Subcontractors, Material Suppliers and laborers or to perform the Guarantee, as applicable.

**Unit Price** An amount stated in the Bid as the price per unit of measurement for Materials or services described in the Contract Documents, which cost shall include overhead, profit and any other expense for the applicable Work.

**Warranty** Legally enforceable assurance for the specified duration from Final Acceptance of quality or performance of Materials or Equipment.

**Waste Area** A location in which natural Materials are to be deposited when not used in the Work.

**Work** The construction services required by the Contract Documents, to include all labor, Materials, Equipment, tools, transportation, supplies, incidental and services performed or provided by the Contractor for the Project.

**Working Drawings** Stress sheets, shop Drawings, erection Plans, false work Plans, framework Plans, cofferdam Plans, bending diagrams for reinforcing steel, or any other supplementary Plans or similar data which the Contractor is required to submit for acceptance.

## ITEM 103 INSTRUCTION TO BIDDERS

- 103.01 Contract Completion and Critical Path Scheduling
- 103.02 Delay Claims
- 103.03 Giving Notice
- 103.04 Examination of Contract Documents
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- 103.06 Subsurface and Concealed Physical Conditions
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by City
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**103.01 Contract Completion and Critical Path Scheduling.** Unless otherwise provided in the Contract Documents, the time for completion of the Project indicated on the Bid or Electronic Bidding Service shall be the time for Contract Completion applicable to the Bidders. Critical path scheduling methods shall be utilized, unless waived by the Authorized Representative in writing.

**103.02 Delay Claims.** The only delays for which the Bidder is entitled to additional compensation are those delays which the Bidder has established were proximately caused by an improper action or failure to act by the Owner.

**103.03 Giving Notice.** Whenever any provision of the Contract Documents requires the giving of notice prior to the execution of the Contract Form, such notice shall be deemed to have been validly given if delivered personally to the Person for whom the notice is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address of such Person known to the giver of the notice. All notices provided to the Bidder by the Engineer shall be copied to the Authorized Representative. All notices provided to the Engineer by the Bidder shall be copied to the Authorized Representative. All notices provided to the Authorized Representative by the Bidder shall be copied to the Engineer.

**103.04 Examination of Contract Documents.** Contract Documents are available through the Electronic Bidding Service. The Bidder shall examine all Contract Documents, including without limitation the Drawings and Specifications for all divisions of Work for the Project, noting particularly all requirements which will affect the Bidder's Work in any way prior to submitting the Bidder's Bid. Failure of a Bidder to be acquainted with the amount and nature of Work required to complete any of the Work, in conformity with all requirements of the Project as a whole wherever set forth in the Contract Documents or reasonably inferred therefrom, will not be considered as a basis for additional compensation.

**103.05 Evaluation of Work Season and Project Site.** The Bidder shall evaluate when the Work may be performed and examine and evaluate the Project site and related Project conditions where the Work will be performed prior to submitting the Bidder's Bid, including without limitation the following:

- (a) The condition, layout and nature of the Project site and surrounding area, including Borrow Areas and Waste Areas, if any;
- (b) The availability and cost of labor;
- (c) The availability and cost of Materials, supplies and Equipment;
- (d) The cost of temporary utilities required;
- (e) The cost of any permit or license required by a local or regional authority having jurisdiction over the Project;
- (f) The usual weather conditions;
- (g) Conditions bearing upon transportation, disposal, handling, and storage of Materials and waste.

**103.06 Subsurface and Concealed Physical Conditions.** The Contractor may rely upon the general accuracy of the technical data contained in reports and drawings provided to the Contractor by the Owner and, except for such reliance on technical data, the Contractor shall not rely upon or make any claim against the City with respect to: (1) the completeness of such reports and drawings for the Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor, and safety precautions and programs incident thereto; or (2) other data, interpretation, opinions, and information contained in such reports or shown or indicated in such drawings; or (3) any Contractor interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions, or information. For example, all interpolations and extrapolations of data performed by the Contractor to estimate locations or quantities of subsurface strata are independent factual assumptions which the Owner does not warrant. Subject to the foregoing, if during the progress of the Work subsurface or concealed physical conditions are encountered at the site differing materially from those indicated in the Contract Documents, or if subsurface or concealed physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work provided for in the Contract Documents, are encountered at the site, the Contractor shall notify the Engineer of the specific differing conditions before they are disturbed or the affected Work is performed. Upon notification, the Engineer will investigate the conditions and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any Work under the Contract, a Change Order may be issued in accordance with Item 117. The City may decline to issue a Change Order if the notice required by 117.11 is not timely provided by the Contractor. If the Contractor fails to timely provide the notice required by 117.11, the Contractor shall be deemed to have waived any and all claims for additional compensation or time extension for the related subsurface or concealed physical conditions.

**103.07 Pre-Bid Meeting.** All Bidders are required to attend the pre-Bid meeting, where the Engineer will answer questions regarding the Contract Documents. If not given in the Legal Notice, notice of the time and place of any pre-Bid meeting to be held will be given by the Engineer to each Person of record holding Contract Documents. A Bidder's failure to attend the pre-Bid meeting will result in his or her bid being rejected as non-responsive.

**103.08 Request for Information or Clarification.** If the Bidder finds any perceived ambiguity, conflict, error, omission or discrepancy on or between any of the Contract Documents, including without limitation the Drawings and Specifications, or between any Contract Documents and any applicable provision of law, the Bidder shall submit a written request to the Engineer for an interpretation or clarification. Such requests must be submitted to the Engineer at least seven Days before the Bid Deadline.

**103.09 Interpretation or Clarification by Addendum.** If the Engineer determines that an interpretation or clarification is warranted, the Engineer shall issue an Addendum through the Electronic Bidding Service. Any interpretation or clarification of the Contract Documents made by any Person other than the Engineer, or in any manner other than an Addendum issued through the Electronic Bidding Service, shall not be binding and the Bidder shall not rely upon any such interpretation or clarification. The Bidder shall not, at any time before or after the execution of the

Contract Form, be compensated for a claim alleging insufficient data, incomplete, ambiguous, conflicting or erroneous Contract Documents, any discrepancy on or between Contract Documents or incorrectly assumed conditions regarding the nature, extent or character of the Work, if no request for interpretation or clarification regarding such matter was made by the Bidder prior to the Bid Deadline in compliance with 103.08.

**103.10 Standards.** The articles, devices, Materials, Equipment, forms of construction, fixtures and other items named in the Specifications to denote kind, quality or performance requirement for each significant portion of the Work shall be known as Standards and all Bids shall be based upon those Standards. Where two or more Standards are named, the Bidder may furnish any one of those Standards. Items which are not Standards may be used only if accepted pursuant to the requirements of 103.11 and 103.12.

**103.11 Proposed Equals.** If the Bidder proposes to use an article, device, material, Equipment, form of construction, fixture or item other than those Standards named in the Specifications, the Bidder shall submit such a proposal to the Engineer, not later than ten Days prior to the Bid Deadline, certifying that the item is equal in quality, and in all aspects of performance and appearance, to the Standards specified. In addition, the Bidder shall submit information to the Engineer not later than ten Days prior to the Bid Deadline, which information shall include:

- (a) The name and a complete description of the Proposed Equal, including Drawings, performance and test data, and other information necessary for a complete evaluation of the Proposed Equal;
- (b) A statement setting forth any changes which the Proposed Equal will require in the Contract Documents or the Project.

**103.12 Approval or Disapproval of Proposed Equals.** If the Engineer, in the exercise of the Engineer's sole unfettered discretion, approves the Proposed Equal as a Standard, the Engineer shall issue an Addendum to that effect through the Electronic Bidding Service. If the Engineer does not approve the Proposed Equal as a Standard, the Engineer shall inform the Bidder of the disapproval in writing, no later than ninety-six hours prior to the Bid Deadline, excluding Saturdays, Sundays and legal holidays, which decision shall be final. The Engineer shall have the discretion to reject a Proposed Equal for any reason, including, but not limited to, the Bidder's failure to provide sufficient information to enable the Engineer to completely evaluate the Proposed Equal without delaying the scheduled Bid Deadline.

**103.13 Substitutions.** If no Addendum is issued approving the Proposed Equal as a Standard, the Bidder may list the item on the Substitution sheet. A Bidder desiring consideration for the use of an article, device, material, Equipment, form of construction, fixture or item other than those Standards named in the Specifications shall submit a Proposal for the Substitution of same for the applicable standard, using the Substitution sheet provided in the Electronic Bidding Service and listing, for each proposed Substitution: the standard specified, the Substitution, and the change in Bid amount, (or indicate no change, if applicable). The name and a complete description including Drawings, performance and test data, and other information necessary for

a complete evaluation of each Substitution shall be furnished to the Engineer by the Bidder promptly upon request. Any Substitution accepted by the City must be incorporated in the Contract in writing. Substitutions shall not be considered in determining of the lowest and best Bid but may be considered in rejecting all Bids.

**103.14 Electronic Bid.** Each Bid shall contain the name of every Person interested therein and be submitted through the Electronic Bidding Service. Instructions for using the Electronic Bidding Service are available on the City's website. Failure to properly submit a Bid through the Electronic Bidding Service may cause a Bid to be rejected as nonresponsive. Unless the Bidder withdraws the Bid as provided in 103.31, the Bidder will be 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 which might indicate a contrary intention.

**103.15 Alternates.** When an Alternate is listed in the Electronic Bidding Service, the Bidder shall complete the applicable portion, indicating an amount which will increase or decrease the Base Bid. The City reserves the right to accept or reject any or all Bids on Alternates, in whole or in part, and the right to reject any Alternate or Alternates and to accept any remaining Alternate or Alternates. Alternates may be accepted or rejected in any order.

**103.16 Submission of Bid.** If the Bidder is a corporation, limited liability company, partnership or sole proprietorship, an officer, member, partner or principal of the Bidder, as applicable, shall submit and electronically sign the Bid through the Electronic Bidding Service. If the Bidder is a joint venture, an officer, member, partner or principal, as applicable, of each participant of the joint venture shall electronically sign the Bid on behalf of that participant, where applicable. By submitting a Bid, the Bidder warrants that it is not now, and will not become subject to an unresolved finding for recovery under Section 9.24 ORC, prior to the award of any Contract arising out of this Project, without notifying the City of such findings. Section 9.24, ORC prohibits the City from awarding a Contract to any Bidder against whom the Auditor of State has issued findings for recovery if the findings for recovery are unresolved at the time of award. The completed Bid submission of the Bidder with whom the City executes a Contract Form shall be incorporated into the Contract Form as if fully rewritten therein.

**103.17 Submittals with Bid.** Where indicated in the Electronic Bidding Service, the Bidder must download all documents that are shown as requiring a download and submit every document that is shown as requiring submission. A Bid shall be rejected if the Bidder fails to submit, or submits not fully complete, any document that is shown as requiring submission.

**103.18 Unit Prices.** When Unit Prices are requested in the Electronic Bidding Service, any scheduled quantities listed by the City are not binding upon the City and are to be used only for the comparison of Bids for purposes of determining the lowest and best Bidder and to determine the maximum quantity to be provided without a Change Order. If Unit Prices are stated to be sought only for informational purposes, they shall not be used for comparison of Bids. Unless otherwise specified in the Contract Documents, the Unit Prices and the totals or extensions thereof set forth shall include all Materials, Equipment, insurance, labor, delivery, installation, overhead, profit and any other cost or expense, in connection with or incidental to,

the performance of that portion of the Work to which the Unit Prices apply. The Bidder shall submit Unit Prices for all items listed unless other instructions are stated.

**103.19 Changes to Unit Price Work.** The Bidder agrees that the City may increase, decrease or delete entirely the scheduled quantities of Work to be done and Materials to be furnished after execution of the Contract Form without invalidating the Contract. Payments, except for lump sum items in Unit Price Contracts, will be made to the Contractor only for the actual quantities of Work performed or Materials furnished in accordance with the Contract Documents, but not in excess of the maximum set by the scheduled quantities. The Contractor must obtain a Change Order prior to performing Work or furnishing Materials in excess of the scheduled quantities in order to be compensated for the excess.

**103.20 Change in Bid Amount.** The Bidder may amend or withdraw its Bid through the Electronic Bidding Service at any time prior to the Bid Deadline.

**103.21 Timely Submission of Bids.** It is the responsibility of the Bidder to submit its Bid through the Electronic Bidding Service prior to the Bid Deadline. Bids arriving after the Bid Deadline shall not be considered.

**103.22 Bid Letting.** Bidders may submit Bids through the Electronic Bidding Service up to the Bid Deadline. At the Bid Deadline, all Bids will be tabulated and the tabulation made public. The public bid tabulation is for informational purposes only and is not to be construed as an acceptance or rejection of any Bid submitted. The electronic Bid submissions shall be a public record and open for inspection, upon request, at any time after the Bid Deadline, except for any information which is not subject to disclosure as provided by applicable law.

**103.23 Bid Deadline Extension.** If any Addendum is issued within Seventy-two hours prior to the published Bid Deadline, excluding Saturdays, Sundays and legal holidays, the Bid Deadline shall automatically be extended one week, with no further advertising required. If any Addendum is issued more than seventy-two hours prior to the published Bid Deadline, excluding Saturdays, Sundays, and legal holidays, the Bid Deadline may be revised by the Addendum, at the City's discretion.

**103.24 Bid Evaluation Criteria.** The City reserves the right to accept or reject any or all Bids, in whole or in part, and reserves the right to reject any Bid or Bids and to award the Contract to any remaining Bidder the City determines to be the lowest and best Bidder. The City reserves the right to accept or reject any or all Alternates, in whole or in part, and the right to reject any Alternate or Alternates and to accept any remaining Alternate or Alternates. Alternates may be accepted or rejected in any order. The City may reject the Bid of any Bidder who has engaged in collusive Bidding, been involved in violations of ethics laws or who has an unresolved finding against it by the Auditor of State as provided in Section 9.24, ORC, as not the lowest and best Bid. The City 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 requirements of the Contract Documents may cause a Bid to be rejected.

**103.25 Bid Evaluation Procedures.** The Contract will be awarded to the lowest and best Bidder as determined in the discretion of the City or all Bids will be rejected in accordance with the procedures set forth in 103.26 through 103.31.

**103.26 Lowest Bidder.** In determining which Bidder is the lowest, the City shall consider the Base Bid and any Alternate or Alternates which the City determines to accept. Substitutions shall not be considered. The total of the Bids for the accepted Alternate(s) shall be added to or deducted from the Base Bid, as applicable, for the purpose of determining the lowest Bidder. If the Project involves multiple Contracts, the City may also receive combined Bids for two or more Contracts, if provided in the Electronic Bidding Service, but no Contract for the entire job or for more than one Contract shall be awarded unless the separate Bids do not cover all the Work and Materials required or unless the combined Bid is lower than the applicable separate Bids in the aggregate. The City may also receive Bids for multiple Projects if provided in the Electronic Bidding Service.

**103.27 Rejection of Bids.** In addition to any other reason provided for in this Item, a Bid shall be rejected if:

- (a) the Bid fails to respond to the Contract Documents in all material respects;
- (b) the Bid contains irregularities or deviations from the Contract Documents which would affect the amount of the Bid or otherwise give the Bidder a competitive advantage;
- (c) the Bid contains a Bid guaranty executed by a Surety not licensed in Ohio; or
- (d) a Bid guaranty that is otherwise determined to be insufficient by the City.

In addition to any other reason provided for in this Item, a Bid may be rejected if:

- (a) the Bid is Mathematically Unbalanced;
- (b) the Bid does not contain an executed Non-collusion affidavit;
- (c) the Bidder fails to furnish Samples and a complete statement of the origin, composition and manufacture of any or all Materials to be used for the Work, when so requested; or
- (d) the Samples provided by the Bidder fail to demonstrate that Materials are of sufficient quality or fitness for the Work.

**103.28 Best Bidder.** In determining whether a Bidder is best, factors to be considered include, without limitation:

- (a) Preferences required by law, where applicable;
- (b) The experience of the Bidder;

- (c) The financial condition of the Bidder;
- (d) Compliance by the Bidder and related Persons with ethics laws and City ordinances and regulations, including without limitation submission of an affirmative action program in accordance with Section 35.16 R.C.G.O.;
- (e) The conduct and performance of the Bidder on previous Bids and Contracts with the City or other owners, which shall include, without limitation, compliance with prevailing wage laws, Workers' compensation, income tax laws and equal opportunity requirements;
- (f) The facilities of the Bidder, including without limitation machinery, plant and Equipment, as applicable;
- (g) The management skills of the Bidder;
- (h) The ability of the Bidder to execute the Contract properly, including whether the Bidder's existing workload may hinder or prevent timely completion of the Work;
- (i) The ability of the Bidder to perform at least fifty-one percent of the Work with its own employees;
- (j) The evaluation of a Bid below the median of other Bids pursuant to 103.37.

A Bidder who submits a Bid for Work for electrical, plumbing, hydronics, refrigeration or heating, ventilating and air conditioning shall provide evidence of a valid Contractor's license from the Ohio Construction Industry Licensing board or successor.

**103.29 Information.** A Bidder shall submit to the Engineer, upon request, any information the Authorized Representative deems appropriate to the consideration of factors showing that such Bidder's Bid is best, including without limitation the following:

- (a) Overall experience of the Bidder, including number of years in business under present and former business names;
- (b) Names and qualifications of key Bidder personnel;
- (c) Complete listing of all ongoing and completed public and private construction Contracts of the Bidder in the last three years, including the nature, status and value of each Contract and a name, address, and phone number for a representative of the Owner of each related Project;
- (d) Complete listing of any EPA, (OSHA) or other regulating entity issues or citations in the last ten years;
- (e) Complete listing of all outstanding liens against the Bidder;
- (f) Certified financial statement with trade and bank references;
- (g) Description of relevant facilities of the Bidder;

- (h) Description of the management experience of the Bidder's Project manager(s) and Superintendent(s); who will be assigned to the Project;
- (i) Complete list of all Subcontractors and Material Suppliers;
- (j) To support a Contract Bond, a current and signed certificate of compliance required under Section 9.311 ORC, issued by the Department of Insurance, showing the Surety is licensed to do business in Ohio;
- (k) Current Ohio Workers' Compensation Certificate.

If the Bidder is a foreign corporation, i.e., not incorporated under the laws of Ohio, a certificate of good standing from the Secretary of State showing the right of the Bidder to do business in the State; or, if the Bidder is an individual or partnership, the Bidder has filed with the Secretary of State a Power of Attorney designating the Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under Section 153.05, ORC, or under Sections 4123.01 through 4123.94, inclusive, ORC.

The Engineer may obtain such information from several Bidders simultaneously. Each Bidder shall provide requested information within such time limits as the Engineer shall establish.

**103.30 Notice of Intent to Award.** The City shall notify the apparent lowest and best Bidder that upon satisfactory compliance with all conditions precedent for execution of the Contract Form, within the time specified, the Bidder will be awarded the Contract. The City reserves the right to rescind any Notice of Intent to Award at any time prior to the execution of the Contract if the City determines the Notice of Intent to Award was issued in error.

**103.31 Withdrawal of Bid.** A Bidder may withdraw its Bid at any time prior to the Bid Deadline through the Electronic Bidding Service. All Bids submitted through the Electronic Bidding Service which were not withdrawn prior to the Bid Deadline shall remain valid and open for acceptance for a period of at least sixty Days after the Bid Deadline; provided, however that during that period a Bidder may withdraw a Bid from consideration 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. Notice of such a request to withdraw a Bid must be made in writing filed with the Authorized Representative within two business Days after the Bid Deadline. The City reserves the right to request that the Bidder submit evidence substantiating the Bidder's request to withdraw the Bid. No Bid may be withdrawn after the Bid Deadline when the result would be the awarding of the Contract on another Bid to the same Bidder. If a Bid is withdrawn after the Bid Deadline, the City may award the Contract to another Bidder that the City determines to be the lowest and best Bidder, or reject all Bids and advertise for other Bids. If the City advertises for other Bids, the withdrawing Bidder shall pay the costs incurred by the City in connection with the rebidding if the City finds that such costs would not have been incurred but for such withdrawal. A Bidder may withdraw its Bid at any time after the expiration of the described sixty Day period by written notice to the Authorized Representative.

**103.32 Refusal to Accept Withdrawal.** If the City intends to contest the right of the Bidder to withdraw a Bid after the Bid Deadline, a hearing shall be held by the Authorized Representative within ten Days after the Bid Deadline and an order shall be issued by the City allowing or denying the claim of such right within five Days after such hearing is concluded. The City shall give the withdrawing Bidder timely notice of the time and place of any such hearing. The City 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. If the City denies the claim for withdrawal and the Bidder elects to litigate or otherwise refuses to perform the Contract, the City may reject all Bids or award the Contract to the next lowest and best Bidder, as determined by the City, without waiving any claims against the non-performing Bidder.

**103.33 Effect of Withdrawal.** No Bidder who is permitted to withdraw a Bid after the Bid Deadline shall for compensation supply any material or labor to, or perform any subcontract or other Work agreement 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 written approval of the City. The Person to whom the Contract is awarded and the withdrawing Bidder shall be jointly liable to the City in an amount equal to any compensation paid to or for the benefit of the withdrawing Bidder without such approval. A Bidder who is permitted to withdraw a Bid after Bid Deadline may be considered not the best for future City Contracts.

**103.34 Bid Estimate.** In no instance shall Contracts be let either as a whole, or in aggregate, if Bids for parts of the Work are taken, which exceed one hundred ten percent of the estimate for the improvement contemplated.

**103.35 Review of Low Bid.** The City may reject a Bid which is

(a) more than twenty percent below the median of all higher Bids received for a Contract where the estimate is one hundred thousand dollars or more; or

(b) more than twenty-five percent below the median of all higher Bids received for a Contract where the estimate is less than one hundred thousand dollars.

In determining whether to reject such a bid, the City may at its discretion, but is not required to:

(a) Conducts an interview with the Bidder to determine what, if anything has been overlooked in the Bid, and to analyze the process planned by the Bidder to complete the Work;

(b) Require the Bidder to submit to the City a certified financial statement and a list of recent public Contracts which the Bidder has performed; and/or

(c) Notify the Bidder's Surety in writing that the Bidder with whom the City intends to enter a Contract submitted a Bid determined to be substantially lower than the median of all higher Bids.

**103.36 Bid Guaranty.** The Bidder must file with the Bid a Bid guaranty, payable to the City of Dayton, in the form of the signed Bid guaranty and Contract Bond contained in the Contract Documents, for the full amount of the Base Bid plus add Alternates. The Bid guaranty shall be submitted through the Electronic Bidding Service. The Bid guaranty shall be in form and substance satisfactory to the City and shall serve as an assurance that the Bidder will, upon acceptance of the Bidder's Bid, comply with all conditions precedent for execution of the Contract Form and execute the Contract Form within the time specified by the City. ANY BID GUARANTY MUST BE PAYABLE TO THE CITY OF DAYTON. A Bid may be rejected if the Bid guaranty is payable to any other Person. IF THE BLANK LINES FOR THE AMOUNT ON THE BID GUARANTY AND CONTRACT BOND ARE NOT FILLED IN, THE PENAL SUM WILL AUTOMATICALLY BE THE FULL AMOUNT OF THE BASE BID PLUS ADD ALTERNATES. If those blank lines are filled in, the amount must not be less than the full amount of the Base Bid plus add Alternates, stated in dollars and cents. A PERCENTAGE IS NOT ACCEPTABLE. The Bid guaranty and Contract Bond must be signed by an authorized agent with Power of Attorney from a Surety. The Bid guaranty and Contract Bond must be issued by a Surety authorized by the Department of Insurance to transact business in Ohio. The requirements of Section 3905.41, ORC, may be applicable to require the Bid guaranty and Contract Bond be countersigned by an Ohio resident agent. The Bidder must determine whether this requirement is applicable to the Bidder's Surety. Bid guaranties will be returned to all unsuccessful Bidders seventy-five Days after the Bid Deadline or upon execution of the Contract Form by the apparently successful Bidder, whichever is earlier.

**103.37 Bid Guaranty Forfeiture.** If for any reason, other than as authorized by 103.31 or 103.38, the Bidder fails to execute the Contract Form, and the City awards the Contract to another Bidder which the City determines is the lowest and best Bidder, the Bidder who failed to execute the Contract Form shall be liable to the City for the difference between such Bidder's Bid and the Bid of the lowest and best Bidder, or for a penal sum not to exceed ten percent of the defaulting Bidder's Bid amount, whichever is less. If the City then awards a Contract to another Bidder which the City determines is the lowest and best Bidder and such Bidder also fails or refuses to execute the Contract Form, the liability of such lowest and best Bidder shall, except as provided in 103.38, be the amount of the difference between the Bid amounts of such lowest and best Bidder and another Bidder which the City determines is the lowest and best Bidder, but not in excess of the liability specified in 103.31. Liability on account of an award to each succeeding lowest and best Bidder shall be determined in like manner. If the City does not award the Contract to the another Bidder which the City determines is the lowest and best Bidder but resubmits the Project for Bidding, the Bidder failing to execute the Contract Form shall, except as provided in 103.38, be liable to the City for a penal sum not to exceed ten percent of such Bidder's Bid amount or the costs incurred by the City in connection with the rebidding, whichever is less.

**103.38 Exception to Bid Guaranty Forfeiture.** A Bidder with the City for a Contract with the City costing less than five hundred thousand dollars may withdraw a Bid from consideration if the Bidder's Bid for some other Contract with the State or any political subdivision, district, institution or agency thereof, excluding ODOT, costing less than five hundred thousand dollars has already been accepted, if the Bidder certifies in good faith that the total price of all such

Bidder's current Contracts is less than five hundred thousand dollars, and if the Bidder's Surety certifies in good faith that the Bidder is unable to perform the subsequent Contract because to perform such Contract would exceed the Bidder's Bonding capacity. If a Bid is withdrawn pursuant to 103.38, the City may award the Contract to another Bidder which the City determines is the lowest and best Bidder or reject all Bids and resubmit the Project for Bidding, and neither the withdrawing Bidder nor such Bidder's Surety shall be liable for the difference between the Bidder's Bid and that of another Bidder which the City determines is the lowest and best Bidder, for a penal sum, or for the costs incurred by the City in connection with the rebidding.

**103.39 Contract Bond.** If the Bidder executes the Contract Form, the Bidder shall, at the time of signing the Contract Form, provide the Contract Bond required by law in form and substance, and from a Surety, satisfactory to the City. The Contract Bond shall be in the full amount of the Contract to indemnify the City against all direct and consequential damages suffered by failure of the Contractor to perform according to the provisions of the Contract Documents and in accordance with the Plans, Specifications, details and bills of material therefore and to pay all lawful claims of Subcontractors, Material Suppliers, and laborers for labor performed or Materials furnished in carrying forward, performing or completing the Contract. A Contract Bond must be signed by an authorized agent with Power of Attorney from the Surety.

**103.40 Personal Property Tax Statement.** The successful Bidder shall provide a properly completed and executed affidavit in a form satisfactory to the City in order to fulfill the requirements of Section 5719.042 ORC, which provides as follows:

After the award by a taxing district of any Contract let by competitive Bid and prior to the time the Contract is entered into, the Person making a Bid shall submit to the district's fiscal officer a statement affirmed under oath that the Person with whom the Contract is to be made was not charged at the time the Bid was submitted with any delinquent personal property taxes on the general tax list of personal property of any county in which the taxing district has territory or that such Person was charged with delinquent personal property taxes on any such tax list, in which case the statement shall also set forth the amount of such due and unpaid delinquent taxes and any due and unpaid penalties and interest thereon. If the statement indicates that the taxpayer was charged with any such taxes, a copy of the statement shall be transmitted by the fiscal officer to the county treasurer within thirty Days of the date it is submitted.

A copy of the statement shall also be incorporated into the Contract, and no payment shall be made with respect to any Contract to which 103.40 applies unless such statement has been so incorporated as a part thereof.

**103.41 Conditions Precedent for Execution of Contract Form by City.** The award of the Contract and the execution of the Contract Form are based upon the expectation that the lowest and best Bidder will execute the Contract Form and comply with all conditions precedent for execution of the Contract Form within ten Days of the date of the issuance of the Notice of Intent to Award. Failure to execute the Contract Form or noncompliance with the conditions precedent for execution of the Contract Form within ten Days of the date of the issuance of the Notice of Intent to Award shall be cause permitting the City to cancel the Notice of Intent to Award for the Bidder's failure to be best, and to award the Contract to another Bidder which the City determines is the lowest and best Bidder or to resubmit the Contract for Bidding, at the discretion

of the City. The City may extend the time for submitting the conditions precedent for execution of the Contract Form for good cause shown. No extension shall operate as a waiver of the conditions precedent for execution of the Contract Form. The conditions precedent for execution of the Contract Form by the City are as follows:

- (a) Contract Form;
- (b) Contract Bond and to support the Contract Bond, a power of attorney for any attorney-in-fact signing the Contract Bond and a certificate of compliance issued by the Ohio Department of Insurance showing the Surety is licensed to do business in Ohio;
- (c) Ohio Workers' Compensation Certificate;
- (d) Certificate of Insurance (ACORD form is acceptable) clearly setting forth all exclusions and deductibles and copy of additional insured or loss payee endorsement. The City reserves the right to request a certified copy of the Contractor's insurance policies, including all endorsements.
- (e) If the Bidder is a foreign corporation, i.e., not incorporated under the laws of Ohio, a Certificate of good standing from the Secretary of State showing the right of the Bidder to do business in the State will be required. If the Bidder is an individual or partnership, the Bidder has filed with the Secretary of State a Power of Attorney designating the Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under Section 153.05 ORC, or under Sections 4123.01 through 4123.94, inclusive, ORC.
- (f) Personal property Tax Statement; and
- (g) Evidence of registration of the Contractor and all of the Contractor's Subcontractors with the Building Department and the City's Department of Finance, Division of Revenue and Taxation.
- (h) Material Declaration of Assistance/Non-Assistance to Terrorist Organization, when required.
- (i) If requested by the City, the Bidder shall immediately submit evidence that the Person signing the Contract is authorized to bind the Bidder.

**103.42 Time Limits.** A Contract Form is not executed until it has been signed on behalf of both the Bidder and the City by Persons authorized to bind the Bidder and the City, respectively. The failure to award the Contract and to execute the Contract Form within ninety Days of the Bid Deadline invalidates the entire Bid process and all Bids submitted, unless the time is extended by written consent of the apparent lowest and best Bidder and the City concurs with such extension. If the Contract is awarded and the Contract Form is executed within ninety Days of the Bid Deadline, any increases in material, labor and subcontract costs shall be borne by the Bidder without alteration of the amount of the Bid. If the cause of the failure to execute the Contract within ninety Days of the Bid Deadline is due to matters for which the City is solely responsible, the Contractor shall be entitled to a Change Order authorizing payment of verifiable increased costs in Materials, labor or subcontracts. If the cause of the failure to execute the

Contract within ninety Days of the Bid Deadline is due to matters for which the Contractor is responsible, no request for increased costs will be granted.

**103.43 Notice to Proceed and Submittals.** The Authorized Representative shall issue the Contractor a Notice to Proceed which shall establish the date for commencement of the time for Contract Completion. The Contractor shall, within ten Days of the date of the Notice to Proceed, furnish the Engineer the following submittals:

- (a) Contract Cost Breakdown;
- (b) Preliminary schedule including shop Drawings and submittals;
- (c) List of Subcontractors;
- (d) List of Material Suppliers;
- (e) Outline of qualifications of proposed Superintendent.

**103.44 Wage Rates and Payment Dates.** The Bidder shall base its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Division of Labor & Worker Safety, Wage and Hour bureau or the U.S. Department of Labor, as applicable, for the Project as provided in Sections 4115.03 and 4115.14, ORC, or the Davis-Bacon Act, respectively. The Contractor shall, within ten Days of the date of the Notice to Proceed, provide to the Engineer for the prevailing Wage Coordinator a schedule of dates during the term of the Contract on which wages will be paid to employees for the Project.

**103.45 Written Submissions in lieu of Electronic Bidding Service.** Where a Bidder is required by a provision in this Item 103 to make a submission through the Electronic Bidding Service, such submission may be made in paper form only upon prior written authorization from the Engineer. The determination whether to grant such prior written authorization is left to the Engineer and may be exercised by the Engineer's sole unfettered discretion. Submissions outside the Electronic Bidding Service without such prior written authorization may result in a determination that the Bid is non-responsive.

## ITEM 104 GENERAL REQUIREMENTS

- 104.01 Contract Documents
- 104.02 Applicable Law and ODOT Matters
- 104.03 Jurisdiction
- 104.04 Assignment of Antitrust Claims
- 104.05 Captions
- 104.06 Nondiscrimination Generally
- 104.07 City's Nondiscrimination Requirements
- 104.08 Notice of Commencement
- 104.09 Giving Notice
- 104.10 Computation of Time
- 104.11 Facsimile Transmission and Electronic Mail
- 104.12 Intent
- 104.13 Requests for Information
- 104.14 Ownership and Use of Drawings and Specifications
- 104.15 Access to Documents
- 104.16 As-Built Drawings
- 104.17 Substitutes for Standards or Approved Equals
- 104.18 Sales and Use Taxes

**104.01 Contract Documents.** The Contractor, the Engineer and the Authorized Representative shall be familiar with all provisions of the Contract Documents.

**104.02 Applicable Law and ODOT Matters.** The Contractor and the City shall comply with all applicable Federal, State and local codes, statutes, ordinances and regulations in the performance of the Work on the Project. When the Federal government or the State pays all or any portion of the cost of the Project, the Work shall be subject to the inspection of the appropriate federal or State agency. No such inspection shall make the Federal government or State a party to the Contract and will in no way affect the rights and obligations of the City and the Contractor under the Contract. Any such inspection is solely for the benefit of the City and the Federal or State agency making it, and neither the Contractor nor the Surety shall be entitled to rely upon it for any purpose. References to ODOT matters shall be as set forth in the CMS current as of the Bid Deadline. In such instances, the CMS is incorporated only to the extent that it is not inconsistent with the Specifications.

**104.03 Jurisdiction.** The Montgomery County Court of Common Pleas, or the United States District Court for the Southern District of Ohio if required by law, shall be the exclusive jurisdiction in which any action or proceeding concerning any Bid, Contract, agreement or performance under the Contract Documents or in connection with the Project shall be filed. In any such action or proceeding the Contract Documents shall be construed in accordance with the laws of the State which shall govern to the exclusion of the law of any other jurisdiction.

**104.04 Assignment of Antitrust Claims.** By executing the Contract Form, the Contractor assigns, conveys and transfers to the City 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 City pursuant to the Contract.

**104.05 Captions.** Captions throughout the Contract Documents are for convenience and reference only and the words contained in a caption shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of the Contract Documents. Rights and responsibilities of the Contractor, the Engineer and the City are set forth throughout the Contract Documents and are included under different titles, articles and paragraphs for convenience.

**104.06 Nondiscrimination Generally.** During the performance of the Contract, the Contractor agrees that in the hiring of employees for the performance of Work, including without limitation Work to be performed by a Subcontractor, no Contractor or Subcontractor, and no Person acting on behalf of the Contractor or Subcontractor, shall, by reason of race, religion, national origin, age, sex, disability, or color, discriminate against any citizen in the employment of labor or workers who are qualified and available to perform the Work to which the employment relates. The Contractor further agrees that no Contractor or Subcontractor, and no Person acting on behalf of the Contractor or Subcontractor, shall, in any manner, discriminate against or intimidate any employee hired for the performance of Work on account of race, religion, national origin, age, sex, disability, or color. In the event of the Contractor's noncompliance with the nondiscrimination clauses, the contract may be terminated or suspended in whole or in part, and the Contractor may be declared ineligible for further City Contracts or such other sanctions as provided by law. Any provision of a hiring hall Contract or agreement which obligates a Contractor to hire, if available, only such employees as are 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 such hiring hall Contract or agreement, or within thirty Days thereafter, such labor organization has in effect procedures for referring qualified employees for hire without regard to race, color, religion, national origin, or ancestry and unless such labor organization includes in its apprentice and journeyman membership, or otherwise has available for job referral without discrimination, qualified employees.

**104.07 City's Nondiscrimination Requirements.** The Contractor shall comply with RCGO, Section 35.14 which provides as follows and any amendments thereto:

(A) The [Contractor] shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, ancestry, national origin, place of birth, age, marital status, or handicap. The [Contractor] shall take affirmative action in accordance with terms outlined in its [Proposal] and the provisions of this [Contract] to insure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, ancestry, national origin, place of birth, age, marital status, or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The [Contractor] agrees to post in conspicuous places, available to employees and applicants, notices to be provided by the [City] setting forth the provisions of the nondiscrimination clauses.

(B) The [Contractor] shall in all solicitations or advertisements for employees placed by or on behalf of the [Contractor], state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, ancestry, national origin, place of birth, age, marital status, or handicap.

(C) The [Contractor] shall send to each labor union or representative of workers with which [the Contractor] has a collective bargaining agreement or other contract or understanding, a notice to be provided by the [City] advising the labor union or workers' representative of the [Contractor's] commitments, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(D) The [Contractor] shall comply with all rules, regulations, and relevant orders promulgated by the Human Relations council pursuant to its duties created by ordinance.

(E) The [Contractor] shall file, and shall cause each of [the Subcontractors and Material Suppliers] to file, compliance reports with the Human Relations Council as may be directed. Compliance reports shall be filed within such times and shall contain such information as to the practices, policies, programs, and employment policies, programs and employment statistics of the [Contractor, Material Supplier, or Subcontractor] and shall be in such form as the Human Relations Council may prescribe.

(F) The [Contractor] shall furnish all information and reports required by this [Contract] and by the rules, regulations, and orders of the Human Relations Council pursuant hereto, and shall permit reasonable access to the [Contractor's] books, records, and accounts by the Human Relations Council or its representative, as necessary for purposes of investigation to ascertain compliance with this [Contract] and rules, regulations and orders.

(G) In the event of the [Contractor's] failure to comply with the equal employment opportunity and affirmative action provisions of this [Contract], including the affirmative action undertaking outlined in it is [Proposal], or with any of the rules, regulations, or orders herein referred to, it is agreed that the [City], at its option, may do any or all of the following:

(1) Cancel, terminate, or suspend this [Contract], in whole or in part [...].

(2) Declare the [Contractor] ineligible for further [City Contracts].

(3) Recover from the [Contractor] by set-off against the unpaid portion of the [Contract], or otherwise pursuant to this [Contract], the sum of fifty dollars per [Day], as [Liquidated Damages] and not as a penalty, for each [Day] that the [Contractor] shall fail to comply with these provisions of the [Contract], as determined by the Human Relations Council in accordance with its rules and regulations, the said sum being fixed and agreed upon by and between the [Contractor] and the [City] because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages which the [City] would sustain in the event of such a breach of contract, and that amount is agreed to be the amount of damages which the [City] would sustain.

(4) Impose such other sanctions as may be imposed by the Human Relations Council pursuant to ordinances passed by the Commission, or seek such other remedies as may be provided by law.

(H) The [Contractor] shall include the provisions of this [Contract] in every subcontract, so that such provisions shall be binding upon each [Subcontractor]. The [Contractor] shall take such action with respect to any subcontracts as the Human Relations Council may direct as means of enforcing such provisions, including sanctions for noncompliance. However, in the event the [Contractor] becomes involved in, or is threatened with litigation with a [Subcontractor] as a result of such direction by the Human Relations Council, the [Contractor] may request the City to enter into such litigation to protect the interests of the City.

**104.08 Notice of Commencement.** The Authorized Representative shall prepare a Notice of Commencement in affidavit form identifying the name and address of the City, the Project, the name, address of the Contractor, the date of execution of the Contract, and the name and address of the Surety for the Contractor, in addition to the name and address of the Authorized Representative upon whom a Claim Affidavit may be served. The Notice of Commencement shall be made available upon request.

**104.09 Giving Notice.** Whenever any provision of the Contract Documents requires the giving of any notice after the execution of the Contract Form, such notice shall be deemed to have been validly given if delivered personally to the Person for whom the notice is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address of such Person known to the giver of the notice. All notices provided to the Contractor by the Engineer shall be copied to the Authorized Representative. All notices provided to the Engineer by the Contractor shall be copied to the Authorized Representative. All notices provided to the Authorized Representative by the Contractor shall be copied to the Engineer.

**104.10 Computation of Time.** When any period of time is referred to in the Contract Documents by Days, it shall be computed to exclude the first and include the last Day of such period. If the last Day of any such period falls on a Saturday, Sunday or a legal holiday, such day will be omitted from the computation and such period shall be deemed to end on the next succeeding day which is not a Saturday, Sunday or legal holiday.

**104.11 Facsimile Transmission and Electronic Mail.** Any notice required to be given by the Contract Documents may be given by facsimile transmission or electronic mail, provided the original signed notice is delivered within two Days after the date of the facsimile transmission or electronic mail. Facsimile transmittals in excess of 10 pages are discouraged.

**104.12 Intent.** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. The Contractor shall provide all labor, Equipment and Materials necessary for the entire completion of the Work described in the Contract Documents and reasonably inferred therefrom to produce the intended results. The Specifications may not be superseded or amended by the Drawings

unless so provided in supplemental Specifications or Special Provisions prepared by the Engineer and approved in writing by the Authorized Representative. The Drawings shall generally govern dimensions, details and locations of the Work and calculated dimensions shall govern over scaled dimensions. The Specifications shall generally govern quality of Materials and workmanship. The organization of the Specifications in divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. In the event of inconsistencies within or between the Contract Documents, the Contractor shall provide the better quality or greater quantity of Work, and shall comply with the stricter requirement. Unless otherwise specified in the Contract Documents, words which have well-known technical or construction industry meanings are used in accordance with such recognized meanings.

**104.13 Requests for Information.** If the Contractor finds any perceived ambiguity, conflict, error, omission or discrepancy on or between any of the Contract Documents, including without limitation, the Drawings and Specifications, or between any of the Contract Documents and any applicable provision of law, the Contractor, before proceeding with the Work, shall submit a written Request for information to the Engineer for an interpretation or clarification. The Contractor shall be responsible for the prompt delivery of any such Request for information. The Engineer shall respond in writing to any and all requests for information within three business Days of receipt. Any interpretation or clarification of the Contract Documents made by any Person other than the Engineer, or in any manner other than in writing, shall not be binding and the Contractor shall not rely upon any such interpretation or clarification. If any change to the Work is made to accommodate unforeseen circumstances, the Engineer shall initiate the appropriate action and notify the Authorized Representative.

**104.14 Ownership and Use of Drawings and Specifications.** All Drawings and Specifications are the property of the City. In making copies of the Drawings and Specifications available, the City does not confer a license or grant permission for any use other than Work on the Project. Unless otherwise specified in the Contract Documents, the Engineer shall furnish to the Contractor, free of charge, 7 sets of Drawings and Specifications if the Contract price is five hundred thousand dollars or less, and 10 sets of Drawings and Specifications if the Contract price is in excess of five hundred thousand dollars. The Contractor may obtain additional copies of the Contract Documents from the Engineer, upon request, at the cost of reproduction, if any.

**104.15 Access to Documents.** The Contractor shall maintain in good order at the Project site one copy of all Drawings, Specifications, Bulletins, Addenda, approved Shop Drawings, catalog data, manufacturer operating and maintenance instructions, certificates, warranties, Change Orders, and other modifications, including As-built Drawings. The Contractor shall at all times permit access to the documents described in 104.15, and any other Contract Documents by the Authorized Representative and the Engineer.

**104.16 As-Built Drawings.** For Projects administered by the Water Engineering Manager of the City's Department of Water, or the Planning and Engineering Manager of the Department of Aviation, the Contractor shall keep an accurate record of all approved changes made to the Drawings to show Work as actually performed where such Work varies from Work as originally shown, including the exact location and depth of underground utility lines. During the performance of the Work, the Contractor shall record, prior to the submission of each Contractor

Payment Request, any approved changes on the Drawings, neatly in a contrasting color, noting new information not shown on the original Drawings. Failure to so record such changes may cause payment to be withheld or delayed. Where shop Drawings are used, the Contractor shall cross reference the corresponding sheet numbers on the Drawings and sections of the Specifications. The Contractor shall note related Change Order numbers where applicable. The Contractor shall keep a record of any change made to the Specifications, noting particularly any variation from manufacturer's instructions and recommendations. 104.16 shall not apply to any Project administered by the Engineer of the Department of Public Works unless required in the supplemental Specifications or Special Provisions for the Project.

**104.17 Substitutes for Standards or Approved Equals.** Requests for substitutes for standards or Approved Equals shall not be considered after the Bid Deadline unless listed on the Substitution sheet or after the Contractor can conclusively demonstrate to the Engineer one of the following conditions:

- (a) All applicable standards and Approved Equals are not available through no fault of the Contractor or the Contractor's Subcontractors and Material Suppliers;
- (b) All applicable standards and Approved Equals are no longer produced;
- (c) All applicable standards and Approved Equals will not perform as designed or intended.

**104.18 Sales and Use Taxes.** Only those Materials which ultimately become a part of the completed Structure or improvement which constitutes the Project will be exempt from State sales tax as provided in Section 5739.02 ORC, and State use tax as provided in Section 5741.01 ORC. The purchase, lease or rental of material, Equipment, parts or expendable items such as 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.

## ITEM 105 CITY'S RIGHTS AND RESPONSIBILITIES

### **105.01 Generally**

### **105.02 Right to Perform and Backcharge**

### **105.03 Right to Partial Occupancy or Use**

### **105.04 City's Right to File Suit**

### **105.05 No Personal Liability of Public Officials**

### **105.06 No Waiver of Legal Rights**

### **105.07 No Estoppel**

**105.01 Generally.** Information and services required of the City may be furnished through the Engineer or the Authorized Representative and shall be furnished in good faith and in a timely manner to avoid interference with, delay, hindrance, disruption or impact to the progress of the Project. The City and the City's officials, employees, consultants, agents and representatives as determined by the Engineer shall at all times have access to the Work whenever the Project is in preparation or progress. Upon the issuance of the Notice to Proceed or at a reasonable time thereafter, the City shall provide the Contractor the Project site in such condition to permit the Contractor to perform the Work. The foregoing are in addition to other rights and responsibilities of the City enumerated herein and especially those in respect to the City's right to prosecute the Work, approve payments and accept the Project.

**105.02 Right to Perform and Backcharge.** If the Contractor provides Defective Work or fails or neglects to perform the Work with the necessary diligence so as to complete the Work within the time specified in the Contract Documents or any portion of the Work by the applicable milestone completion date as set forth in the current Project, the Engineer shall notify the Contractor in writing of such failure or neglect. If such Defective Work, failure, or neglect results in a threat to the safety of any person or property, the Contractor shall immediately commence to correct such Defective Work, failure, or neglect upon receipt of written or oral notice thereof. Otherwise, if the Contractor fails or refuses to cure such Defective Work or failure or neglect within three business Days after receipt of the written notice or immediately in the case of a threat to any person or property, the Engineer shall recommend enforcement of the Contract to the City pursuant to 106.02 and 106.03. Without prejudice to any other remedy the City may have, the City may employ upon the Work the additional force, or supply the Materials or such part of either as is appropriate, to correct the deficiency in the Contractor's Work, as determined by the Authorized Representative. In all such cases of Defective Work, failure, or neglect, a Change Order shall be issued deducting from payments then or thereafter due the Contractor the costs arising out of or related to investigating and correcting such Defective Work, failure or neglect, including without limitation, the City's attorneys' and consultants' fees and Liquidated Damages. If the payments then or thereafter due the Contractor are not sufficient to cover such costs, the Contractor and the Contractor's Surety shall pay the amount of the insufficiency to the City. The decision of the Authorized Representative to backcharge the Contractor shall be final, subject to proceedings in accordance with 118.01 through 11

The City reserves the right to furnish at any time such Materials and labor and to prosecute such Work in addition to the Work of the Contractor as the City may desire; provided, however, that if such prosecution of additional Work should unreasonably interfere with, disrupt, hinder, delay or impact the Work of the Contractor, the Contractor shall be entitled to a reasonable extension of time in accordance with these Specifications.

**105.03 Right to Partial Occupancy or Use.** If the City finds it necessary to occupy or use the Project, or a designated portion of the Project prior to Contract Completion, such use may be accomplished if the Engineer informs the City that the portion in question has been approved for occupancy use, including by the Department of Building Services, if applicable. If Partial Occupancy or Use is approved by the City, the Engineer may process either a Change Order or a Certificate of Partial Occupancy or Use for the applicable portion of the Project listing the uncompleted or Defective Work under the Contract for approval by the City, provided that no such occupancy or use shall commence before any insurers providing property insurance have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. From the date of execution of the Change Order or Certificate of Partial Occupancy or Use by the Engineer, the Contractor shall be relieved of obligation to maintain the accepted portion of the Work, but shall remain obligated to correct any incomplete or Defective Work, including, without limitation any Punch List items then uncorrected. The Contractor shall continue to carry the appropriate insurance during performance of any such Work. Partial Occupancy or Use of the Project by the City shall not constitute acceptance of any Work not in conformity with the Contract Documents. Partial Occupancy or Use shall not relieve the Contractor of liability for any express or implied warranties or from responsibility for Defective Work.

**105.04 City's Right to File Suit.** The City may maintain an action in its own name for violations of any law relating to the Project, for any injury to Persons or property pertaining to the Work or for any other cause which is necessary in the performance of the City's duties.

**105.05 No Personal Liability of Public Officials.** In carrying out the provisions of the Contract Documents, or in exercising any power or authority granted to them by or within the scope of the Contract Documents, there shall be no liability upon the officers and employees of the City, whether personally or as officials of the City, it being understood that in all such matters they act solely as agents and representatives of the City.

**105.06 No Waiver of Legal Rights.** No action or omission by the City or the City's officers and employees, nor any approval of any request for payment, claim, or Change Order, nor any payment for or acceptance of any Work, nor any extension of time, nor any possession taken by the City or the City's officers or employees shall operate as a waiver of any provision of the Contract Documents, or of any power herein reserved to the City, or any right to damages herein provided; nor shall any waiver of any breach of the Contract be held to be a waiver of any other subsequent breach.

**105.07 No Estoppel.** The City shall not be precluded or estopped by any return or certificate given by the Contractor either before or after the final completion and acceptance of the Work from showing the true and correct amount and character of the Work done and Materials furnished, or from showing at any time that any such return or certificate is untrue and incorrect or improperly made, or from showing that the Work, Materials or Equipment do not conform to the Contract Documents or from demanding and recovering from the Contractor such damages as the City may sustain by reason of the Contractor's failure to comply with the Contract Documents.

## ITEM 106 THE ENGINEER

### 106.01 Project Inspection

### 106.02 Rejection of Work

### 106.03 Contract Administration

### 106.04 Monitoring Progress

### 106.05 Interpretation

### 106.06 Authorization of Inspection, Testing and Approval

### 106.07 Review of Payment Requests

### 106.08 Review of Submittals

### 106.09 Preparation of Change Orders

### 106.10 Final Inspections

### 106.11 Claims Services

### 106.12 Project Rules and Hours

### 106.13 Construction Schedule

**106.01 Project Inspection.** The Engineer or Inspector shall inspect the progress and quality of the Work, including the preparation, fabrication or manufacture of Materials and Equipment, for conformity to the Contract Documents. The Engineer shall be provided access to all parts of the Project and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection. Inspection by the Engineer or an Inspector is solely for the benefit of the City and shall not relieve the Contractor of any of its responsibilities under the Contract Documents. When any unit of government, political subdivision or railroad corporation is to pay a portion of the cost of the Work, its representatives shall have the right to inspect the Work. Such inspection shall in no sense make any unit of government, political subdivision or railroad corporation a party to the Contract, and shall in no way interfere with the rights of the City or the Contractor under the Contract. The Inspector is not authorized to issue instructions contrary to the Contract Documents or to act for, or for the benefit of, the Contractor. Changes to the Contract Documents must be made in accordance with 117.01 through 117.12. No inspection performed pursuant to this Section shall constitute acceptance of the Work.

**106.02 Rejection of Work.** The Engineer or an Inspector shall have the authority to disapprove or reject any item of Work which is Defective, or that the Engineer or Inspector believes will not produce a Project that conforms to the Contract Documents, or that will prejudice the integrity of the design concept of the Project as a functioning whole as indicated by the Contract Documents. The Engineer or Inspector shall immediately notify the Authorized Representative and the Contractor at any time that Work has been disapproved or rejected. The Engineer or Inspector shall not be responsible for construction means, methods, manners, techniques, sequences, procedures, 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. No failure of the Engineer or Inspector to reject the Work shall constitute acceptance of the Work.

**106.03 Contract Administration.** The Engineer or his designee shall provide administration of the Contract for the Project as provided by the applicable agreement between the City and the Engineer, if any, and the Contract Documents. The Engineer shall attend any

and all progress and coordination meetings. The Engineer shall prepare a written report of each progress and coordination meeting and transmit it to the Authorized Representative within three business Days of the meeting. The Engineer shall not delegate the duty to prepare the written report of any Project and coordination meeting attended. The Engineer or Inspector may authorize minor changes or alterations in the Work not involving additional costs or time and not inconsistent with the overall intent of the Contract Documents but has no authority to authorize the Contractor to perform additional or extra Work for which the Contractor will seek compensation in addition to the Contract price or extension of the time for Contract Completion. The Engineer shall review and approve, or recommend approval, of all forms required under the Contract Documents. The Engineer shall render decisions in connection with the Contractor's responsibilities under the Contract Documents and submit recommendations to the Authorized Representative for enforcement of the Contract as necessary.

**106.04 Monitoring Progress.** The Engineer shall monitor the progress of the Work for conformance with the Construction Schedule and shall initiate revisions of the Construction Schedule as required by the Contract Documents. In the event of default by the Contractor, the Engineer may pursue the Contractor's Surety to Contract Completion. The Engineer 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.

**106.05 Interpretation.** The Engineer will be the initial interpreter of all requirements of the Contract Documents. All decisions of the Engineer shall be subject to final determination by the City. Contractor acknowledges that Engineer, within its limited agency for the City, may consult with the City's legal counsel and that all such consultation and communications are privileged.

**106.06 Authorization of Inspection, Testing and Approval.** The Engineer shall authorize special inspection, testing or approval of the Work, as provided in 107.31, whenever in the Engineer's reasonable opinion such action is necessary or advisable to insure conformity with the Contract Documents.

**106.07 Review of Payment Requests.** Based upon the Engineer's on-site observations and evaluation of the Contractor's Payment Request, the Engineer shall review and certify the amounts due the Contractor. The Authorized Representative may recommend to the City that payment be withheld from, or Liquidated Damages be assessed against, a Contractor's Payment Request, stating the reasons for such recommendation. The Engineer's certification for payment shall constitute a representation to the City that the Work has progressed to the point indicated and that, to the best of the Engineer's knowledge, information and belief, the Work is in conformity with the Contract Documents and the Contractor is entitled to payment in the amount certified.

**106.08 Review of Submittals.** The Engineer shall review and approve or take other appropriate action upon the Contractor's submittals within the required time for the purpose of checking for conformity with the Contract Documents. Such review and approval shall not relieve Contractor of its duty to strictly conform to the Contract Documents.

**106.09 Preparation of Change Orders.** The Engineer shall prepare all Bulletins and Change Orders, including a cost estimate and supporting documentation and data. Once executed, a Change Order shall constitute the full and complete satisfaction for all claims of all direct and indirect costs, overhead costs of all kinds, inefficiency costs, acceleration costs, the cumulative impact of the Change Order and other Change Orders executed prior to it, the impact of the Change Order on unchanged work and interest related thereto, which has been or may be incurred by Contractor in conjunction with the change in scope and/or project extension set forth in the Change Order.

**106.10 Final Inspections.** The Engineer shall conduct inspections to determine the date of Contract Completion and shall receive, review and forward to the appropriate Person all Project record submittals required by the Contract Documents. Such inspection shall not constitute acceptance of the Work, nor shall it relieve Contractor from its duty to correct defective or non-confirming work not noted during the inspection.

**106.11 Claims Services.** The Engineer shall render analyses, written recommendations, or decisions, within the time specified, on all claims, disputes, or other matters in question between the Contractor and the City and shall provide information or services to the City until final disposition of all such claims, disputes, and matters. If Engineer does not approve a Contractor claim or fails to act within the required time, Contractor's claim shall be considered to be denied.

**106.12 Project Rules and Hours.** The Engineer shall consult with the Authorized Representative to obtain full knowledge of all City rules, regulations or requirements affecting the Project. The Engineer shall establish the regular working hours with the Contractors, subject to approval of the Engineer.

**106.13 Construction Schedule.** The Engineer shall review the Construction Schedule together with a schedule of submittals which is coordinated with the Construction Schedule in accordance with 109.05 through 109.09. If the Contractor fails to prosecute the Work in accordance with the Construction Schedule, the provisions of 105.02 may be invoked.

## ITEM 107 THE CONTRACTOR

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**107.01 Construction Procedures.** The Contractor shall be responsible for and have control over all construction means, methods, manners, techniques, sequences and procedures for all portions of the Contractor's Work and shall be responsible for any injury or damage which may result from the Contractor's Work or from improper construction, installation, maintenance or operation to the fullest extent permitted by law. Unless otherwise specified in the Contract Documents, the Contractor shall be responsible for properly and accurately laying out all lines, levels, elevations, grades and measurements for all the Work required by the Contract Documents and for the preservation of all related stakes and markers.

**107.02 Cutting, Fitting and Patching.** The Contractor shall do any cutting, fitting or patching required for the Contractor's Work and shall not endanger the Project by cutting, excavating or otherwise altering the Project, or any part of it. If Contractor requires sleeves, the Contractor shall furnish and coordinate the installation of the sleeves. The Contractor shall be responsible for the exact location and size of all holes and openings required to be formed or built for the Work, to permit coordination with any Work performed by other Persons on the Project. The Contractor shall allow sufficient time for installation of any Work performed by other Persons before covering or closing the applicable portion of the Project. Patching shall match and blend with the existing or adjacent surface. Any patching required because of Defective or ill-timed Work shall be done by and at the expense of the Contractor.

**107.03 Excavation.** The Contractor shall not cut away any Structure or dig under any foundation or into any wall, or any other part of the Project, without the written approval of the Engineer. Unless otherwise specified in the Contract Documents, the Contractor, prior to starting excavation or trenching, shall give notice at least two business Days in advance to the Owners of underground utilities registered with the Ohio Underground Utility Protection Services (OUPS) at [www.oups.org](http://www.oups.org), or by phone at (800) 362-2764 and the Owners of underground utilities shown on the Drawings and Specifications who are not registered members of OUPS. The Owner of an underground utility is required within forty-eight hours of notice, excluding Saturdays, Sundays and legal holidays, to stake, mark or otherwise designate the location of its utilities in the construction area together with its approximate depth. If any underground utility Owner fails to timely perform, the Contractor shall immediately notify the Engineer and contact the Owner of the underground utility. If any underground utility must be moved or adjusted, the Contractor shall notify the Owner of the underground utility in a timely manner so that the Work will not be delayed. Unless otherwise provided in the Contract Documents, any movement or adjustment of any underground utility or utility appurtenances, including without limitation electrical and gas meters, water and gas valves and light standards within the Project site is made by the Owner of the utility at the utility Owner's expense. In performing any excavation or trenching, the Contractor shall exercise caution and implement appropriate safety precautions to avoid property damage and personal injury. The Contractor shall backfill any excavation with the material specified and approved by the Engineer. The right to construct or reconstruct any utility service in the street or right of way or to grant permits for same, at any time, is hereby expressly reserved to the City and the Contractor shall not be entitled to any damages for the digging up of the street or Right-of-Way in accordance with such a permit. Any Person wishing to make an opening in the street must secure a permit from the City. The Contractor shall allow Persons bearing such permits, and only those Persons, to make openings in the street or Right-of-Way. When required by the Engineer, the Contractor shall make all necessary repairs due to such openings under the same conditions as the Work. Any adjustment of the Contract price or of the time for Contract Completion resulting from any such opening or repair may be made by Change Order. When the Work includes construction of underground lines and Structures, the Contractor shall make temporary restoration of street surfaces immediately upon completion of the underground lines and Structures, shall remove surplus excavated Materials and shall grade the street and put it into a safe and passable condition. The Contractor shall immediately refill any settlement in or adjacent to trenches for such construction to the proper grade.

**107.04 Borrow and Waste Areas.** A Change Order may be issued in accordance with 117.01 to 117.12 to permit the Contractor to use natural Materials found on the site of the Project.

Whenever Materials are to be borrowed or wasted in borrow or Waste Areas or, if allowed by the Contract Documents, wasted on the Project site, the Contractor shall prior to beginning borrow or wasting operations, obtain the Engineer's written approval of a detailed operation plan that addresses the following concerns:

- (a) Control of drainage water;
- (b) Cleanup, shaping, and restoration of disturbed areas;
- (c) Disposal of regulated Materials;
- (d) Avoidance of regulated areas;
- (e) Excavation and filling of waste and Borrow Areas;
- (f) Saving of topsoil;
- (g) Measures to minimize sediment runoff, including keeping sediment and other contaminants from leaving the Project site and from entering streams, lakes, or reservoirs by using methods provided in the Contract Documents.

The Contractor shall use the current versions of ODOT's *Sediment and Erosion Control Handbook* and the *Location and Design Manual, Volume 2, Drainage Design* to design and plot a sedimentation and erosion control plan on Project plan sheets and ensure the plan complies with all current provisions of ORC, Chapter 6111 and the NPDES permit. The Contractor shall not waste material and discharge dredge or fill Materials into the "Waters of the United States" or an isolated wetland without the required permits from U.S. Army Corps of Engineers (404 Permit) and the Ohio EPA (401 Permit). The Contractor shall have the proposed borrow and Waste Areas reviewed by a qualified environmental consultant approved by the City and have the environmental consultant certify that the proposed borrow and waste operations will not impact the "Waters of the United States" or an isolated wetland. If consultant certification is not provided, the Contractor shall obtain the 404/401 Permits necessary to perform the operations as proposed and have the environmental consultant certify that the Work conforms to the requirements of the permits. The Contractor shall provide copies of all documentation submitted to obtain the appropriate permits and copies of the permits to the Engineer. The Contractor shall not waste or borrow material from a cultural resource site or a site eligible for the national Register of Historic Places. For sites found to have historic or prehistoric human remains, the Contractor shall comply with the requirements of Sections 2909.05 and 2927.11, ORC. If the Contract Documents require a cultural resource investigation, a qualified environmental consultant approved by the City for cultural resource investigation shall be used to review and certify that the waste or Borrow Area:

- (a) does not impact a cultural resource;
- (b) is not a cultural resource;
- (c) is not eligible for the national Register of Historic Places; or
- (d) does not consist of historic or prehistoric human remains.

If burning is permitted under the OAC-3745-19 and Section 1503.18, ORC, the Contractor shall submit a copy of the Ohio EPA permit and the Ohio DNR permit to the Engineer and copies

of all information used to obtain the permit. All damage to surrounding property resulting from the instability of borrow and Waste Areas, the removal of borrow Materials, the placement of waste Materials, or the hauling of material to and from these areas is the sole responsibility of the Contractor. Prior to the disposal of waste Materials outside the Project site, the Contractor shall submit to the City an executed copy of the Contract or permission statement from the property Owner. The Contract or permission statement must indicate that the waste Materials are not the property of the City, that the City is not a party to the Contract or permission statement and that the Contractor and property Owner will hold the City harmless from claims that may arise from their Contract or permission statement. Restoration of all borrow and Waste Areas includes cleanup, shaping, replacement of topsoil, and establishment of vegetative cover by seeding and mulching according to the Contract Documents. The Contractor shall ensure that the restored area is well drained unless approval is given by the Engineer to convert a pit area into a pond or lake, in which case the Contractor shall confine restoration measures to the disturbed areas above the anticipated normal water level, and that any proposed waste location is not within the FEMA mapped one hundred year floodplain. If the proposed waste location is within the FEMA mapped one hundred year flood plain, the Contractor shall submit written approval from the local floodplain coordinator for the site. The floodplain coordinator contacts for each county are available through the Ohio DNR, Division of Water, (614) 265-6750. No extension of time or additional compensation will be paid for any delays due to not having the written permit(s) to waste in a floodplain.

**107.05 Construction and Demolition Debris.** OAC-3745-37, OAC-3745-400, and Chapter 3714 ORC, regulate the use and disposal of construction and demolition debris. The Contractor shall notify the local Board of Health or the local Ohio EPA office seven Days before placing clean hard fill off the Project site or Right-of-Way and submit copies of this notification to the Engineer. The Contractor shall dispose of debris containing wood, road metal, or plaster at a licensed construction and demolition debris site. The disposal of brush, trees, stumps, tree trimmings, branches, weeds, leaves, grass, shrubbery, yard trimmings, crop residue, and other plant matter is restricted. If allowed by the Contract Documents, the Contractor may waste brush, trees, stumps, tree trimming, branches, weeds, leaves, grass, shrubbery, yard trimmings, crop residue, and other plant matter within the Project site or the Right-of-Way. Otherwise, the Contractor shall submit a plan and any required permits to legally dispose of these Materials off the Project site or Right-of-Way to the Engineer and shall provide all documents submitted to obtain this permit to the Engineer. If the Project contains garbage or solid and hazardous waste, the Contractor shall comply with applicable laws and any applicable provisions of the Contract document for the removal of these items. When wasting PCC, the Contractor shall mix the PCC with at least thirty percent natural soil to construct an inner core in the Waste Area, cover this inner core with 3 feet of natural soil on the top and eight feet on the side slopes and place and compact the material according to the Contract Documents to prevent future settlement and sliding.

**107.06 Manufacturer's Recommendations.** The Contractor shall install all Work in accordance with the Contract Documents and any recommendations of the manufacturer, including required temperature and humidity for installation of the various Materials.

**107.07 Construction Supervision.** The Contractor shall provide continuous supervision at the Project by a competent Superintendent when any Work is being performed, unless waived by the Authorized Representative. The Superintendent shall have responsibility and authority to

act on behalf of the Contractor. All communications to the Superintendent shall be as binding as if given directly to the Contractor. The Contractor shall submit an outline of the qualifications and experience of the Contractor's proposed Superintendent, including references, to the Engineer within ten Days of the Notice to Proceed. The City reserves the right to reject the Contractor's proposed Superintendent. Any such rejection shall be determined by the Authorized Representative. Failure of the Authorized Representative to notify the Contractor of such rejection within thirty Days of receipt of the required information shall constitute notice that the City has no objection. If the City rejects the Contractor's proposed Superintendent, the Contractor shall replace the Superintendent at no additional cost to the City. The Contractor shall not change or terminate the Superintendent without written approval of the Authorized Representative. If the Contractor proposes to change or terminate the Superintendent, the Contractor shall submit to the Engineer a written justification for the change or termination, along with the name and an outline of qualifications experience of the Contractor's proposed new Superintendent, not less than ten Days prior to any change or termination. The procedure provided above shall be applied to evaluate the Contractor's proposed new Superintendent. If in the City's sole discretion, the performance of the Superintendent is unsatisfactory at any time, the City may require that Contractor replace such Superintendent with a Superintendent satisfactory to the City at no additional cost to the City.

**107.08 Protection of Project, Property and Utilities.** The Contractor shall protect the Work from weather, and shall maintain the Work and all Materials, including Materials delivered to the Contractor by the City, apparatus, fixtures and other items on or adjacent to the Project site free from injury or damage until Final Acceptance. Non-rubber tired vehicles or Equipment shall not be moved on City streets and off road vehicles shall not be used on bases or pavements without the written approval of the Engineer. Work or items likely to be damaged shall be covered or protected at all times to prevent damage. Any Work or item damaged by failure of the Contractor to provide coverage or protection shall be removed and replaced with new Work or a new item, as applicable, at the Contractor's expense. The Contractor shall perform the Work within the site of the Project and any applicable easement or Right-of-Way. Any adjacent property, including without limitation roads, walks, shrubbery, plants, trees or turf, damaged during the Contractor's Work shall be properly repaired or replaced at the Contractor's expense. Unless otherwise specified in the Contract Documents, the Contractor shall protect the Project and existing or adjacent property and utilities from damage at all times and shall erect and maintain necessary barriers, furnish and keep lighted necessary danger signals at night, and take precautions to prevent injury or damage to individuals or property. When mailboxes, road or street name signs and supports are within the Project site, the Contractor shall remove and erect them in a temporary location during construction in a manner satisfactory to the Engineer. After completion of the Work, the Contractor shall erect the mailboxes, road or street name signs and supports in a permanent location in accordance with the Drawings unless otherwise required by Change Order. Removal, temporary erection and permanent erection shall be in accordance with United States postal regulations. When cornerstones, monuments and property corner pins are encountered in the performance of the Work, and monument covers are not listed in the Bid, the City will supply them and supervise their precise location and installation, and the Contractor will furnish all the labor, Materials and Equipment required for such installations. 105.02 may be invoked for the cost to the City for repair, re-evaluation of location and replacement of any cornerstone, monument or property corner pin within the Project, damaged, destroyed or made inaccessible during the progress of the Work by the Contractor. Existing surface or overhead Structures or utility lines are not necessarily shown on the Drawings and the locations of those shown are approximations. The Contractor shall make such investigations as are necessary to determine the extent to which existing surface or overhead Structures may interfere with the

performance of the Work. Any sizes, locations, and depths for such Structures are approximations and the Contractor shall make such investigation or exploration as may be necessary to determine the actual sizes, locations and depths. The Contractor shall field locate all existing utilities before setting line and grade. Unless otherwise specified in the Contract Documents, the Contractor shall remove all snow and ice as may be required for access to and performance of the Work.

**107.09 Load Restrictions.** The Contractor shall not load, nor permit any part of the Project to be loaded, in any manner that will endanger the Project, or any portion thereof, nor shall the Contractor subject any part of the Project or existing or adjacent property to stress or pressure that will endanger the Project or property. The Contractor shall provide all temporary bracing, shoring and other structural support required for safety of the Project and proper execution of the Work, including without limitation all necessary support and protection of the property of any utility. The Contractor shall comply with all legal load restrictions in the hauling of Materials on public roads and shall operate Equipment of a weight or so loaded as to not cause damage to Structures, Roadway, or other construction. A special permit will not relieve the Contractor of sole liability for damage which may result from the moving of Equipment or Materials. The Contractor shall not haul on concrete pavement, base or Structures before the expiration of the curing period.

**107.10 Materials and Equipment.** The Contractor shall provide only new Materials and Equipment of the quality specified in the Contract Documents. The Contractor shall immediately remove Materials or Equipment not conforming to the requirements of the Contract Documents. The Contractor shall not incorporate Materials or Equipment, the defects of which have been corrected without written approval from the Engineer. If the City is to furnish any Materials, the City shall deliver them in accordance with the Contract Documents. The Contractor shall coordinate and schedule sufficient time for any such delivery. The Contractor shall provide domestically produced steel as required by law including Sections 153.011 and 5525.21, ORC, and Federal laws and regulations, if applicable. The Contractor shall furnish documentation to the Engineer evidencing the domestic origin of applicable steel and iron products before they are incorporated into the Project. Steel and iron products without a traceable, documented domestic origin will be treated as non-domestic products. The City may reject any item or material provided by a Contractor in violation of this requirement. The Contractor shall notify the Engineer of proposed sources of Materials prior to delivery. The Engineer may approve Materials at the source of supply before delivery. If the proposed source of supply cannot produce the specified Materials, the Contractor shall furnish Materials from Alternate sources without adjustment of the Contract price or the time for Contract Completion.

**107.11 Storage.** Only the material and Equipment which are to be used directly in the Work shall be brought to or stored at the Project by the Contractor and the Contractor's Subcontractors and Material Suppliers. The Contractor shall be responsible for the proper handling and storage of all material and Equipment brought or delivered to the Project to assure preservation of their quality and fitness for the Project and to facilitate inspection of them. Aggregates shall be transported from any storage site to the Project in tight vehicles so constructed as to prevent loss or segregation of Materials after loading and measuring in order that there may be no inconsistencies in the quantities of Materials intended for incorporation in the Project as loaded, and the quantities as actually received at the site of the Project. After any material or Equipment is no longer required for the Work, the Contractor shall promptly remove

such material and Equipment from the Project. The Contractor's Materials and Equipment shall not be stored in any Right-of-Way unless the location of such storage is approved by the Engineer. The Contractor shall, before storing Materials in gutters, lay suitable drains of sufficient size to carry all the storm water flowing in such gutters. Where the drainage from cross streets or alleys is interfered with or cut off by reason of the nature of the Work, the Contractor shall provide suitable crossings for pedestrians. No material or Equipment shall be stored within 20 feet of any fire hydrant. Private property shall not be used for storage of material and Equipment without the prior written permission of the Owner or lessee of the private property, and if requested by the Engineer, the Contractor shall provide a copy of the written permission to the Engineer. The Contractor shall restore all storage sites to their original conditions. The Contractor's material and Equipment shall not cause damage to the Project or adjacent property and shall not endanger any individual at, or in the vicinity of, the Project. Any injury to any individual or damage to property resulting from the Contractor's material or Equipment shall be the responsibility of the Contractor.

**107.12 Labor.** The Contractor shall maintain a sufficient workforce to timely perform the Work and enforce good discipline and order among the Contractor's employees and the employees of the Contractor's Subcontractors and Material Suppliers. The Contractor shall not permit employment of individuals not skilled in tasks assigned to them. The Contractor shall dismiss from the Project any individual employed by the Contractor or the Contractor's Subcontractors and Material Suppliers who is found by the Authorized Representative, pursuant to a recommendation from the Engineer, to be incompetent, guilty of misconduct, or detrimental to the Project. 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.

**107.13 Maintenance of Utilities.** The Contractor shall at all times provide and maintain access to fire hydrants, water valves, water service boxes, gas valves, gas service boxes, manholes and other similar appurtenances. During the course of construction, the Contractor shall be solely responsible to notify any utility or other service when such utility or service is encountered. The Contractor shall protect all above ground utilities, Structures and appurtenances and shall replace any damaged portions thereof. The Contractor shall protect all below ground utilities, Structures and appurtenances that may be accurately located by removing manhole covers, valve box covers, and other access point coverings with reasonable effort using hand tools for such removal and shall replace any damaged portions thereof.

**107.14 Maintenance of Traffic.** Vehicular and pedestrian public traffic shall be maintained during the Project whether it is traffic through the Project or only cross traffic at intersections, unless otherwise provided in the Contract Documents. The Contractor shall make all repairs to roads necessary to maintain traffic to the satisfaction of the Engineer. If there are locations on the Project where Sewer or water line construction only is called for and a part of the existing pavement will remain in place, traffic shall be maintained and ingress and egress to all public and private entrances shall be provided. The Contractor shall provide all necessary flaggers. The Contractor shall provide and maintain access to adjacent property including by constructing necessary temporary walks, driveways, Bridges, crossings, and Roadways. The Contractor shall notify the applicable fire and police department whenever a street or alley, or a portion of a street or alley is about to be closed to traffic and shall provide notice when such street or alley or portion thereof is to be opened. In the event of the complete closure of any street,

alley or private drive, the City shall give notification to the occupants of all premises affected by the closure. The Contractor shall promptly notify the Engineer of all unforeseen effects of the Project on traffic. Unless the Contract Documents provide otherwise, all traffic control devices shall be furnished, erected, maintained and removed by the Contractor in accordance with the OMUTCD.

**107.15 Safety Precautions.** The Contractor shall take reasonable, diligent precautions and shall be responsible for the safety of individuals on or adjacent to the Project and shall comply with all applicable provisions of federal, State and municipal safety laws, regulations, and building codes to prevent injury to individuals on or adjacent to the Project. The Contractor shall comply with the rules, regulations and orders of OSHA. The Contractor shall be responsible for any fine or cost incurred as a result of any violation or alleged violation of such rules, regulations or orders. The Contractor shall take reasonable, diligent precautions and shall be responsible for the safety of the Project, including without limitations all Materials and Equipment incorporated or to be incorporated in the Project. Prior to the start of any Work, the Engineer shall meet with the Contractor and other applicable Person to coordinate the Contractor's methods and Equipment for protecting the Project, other property and individuals from damage or injury, in accordance with applicable regulations. The Engineer efforts at coordination shall not relieve the Contractor of any responsibility for safety or ensure the Engineer to become responsible for safety. Methods and Equipment for protecting the Project, other property and individuals shall be subject to inspection and approval of the appropriate authority having jurisdiction over the Project site.

**107.16 Work Stoppage Due to Hazardous Materials.** In the event the Contractor, except a licensed abatement Contractor, encounters Materials reasonably believed to contain asbestos, polychlorinated biphenyl (PCB) or other hazardous waste or material, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Authorized Representative and the Engineer in writing. A licensed abatement Contractor shall report the condition to the Authorized Representative and the Engineer in writing and shall remove the waste or material or render it harmless. The Work in the affected area shall be resumed upon written notice from the Engineer that the waste or material has been removed or rendered harmless. The term "rendered harmless" shall mean that the level of exposure is less than any applicable exposure standards set forth by OSHA or other applicable regulations. Hazardous Materials to be used at the Project shall be identified by a MSDS. The applicable MSDS shall be prepared by the Contractor and submitted to the Engineer prior to a hazardous material being brought to the Project site. The Contractor shall maintain all applicable MSDS on site whenever Work is in preparation or progress.

**107.17 Vehicle Damage Claims.** When a Person reports damage to a vehicle, whether orally or in writing, to the Contractor, the Contractor shall file a written report, including copies of applicable police reports, with the Authorized Representative within three Days.

**107.18 Fire Hydrants.** The Contractor shall make any necessary arrangements with the City Department of Water for any use of fire hydrants in connection with the Work and shall pay for all water used from the hydrants. Permits from the Department of Water for use of fire hydrants shall be provided to the Engineer upon request.

**107.19 Engineer Facilities.** Unless otherwise specified in the Contract Documents, the Contractor shall provide and maintain in a clean condition the following temporary facilities, Equipment and services for use by the Engineer:

- (a) If space is available near the Project, 2 separate office spaces, both of which shall be adequately heated, lighted, air conditioned, and with doors which lock, the keys to which shall be provided to the Engineer;
- (b) If space is not available near the Project, a standard width job trailer shall be provided, which shall be adequately heated, lighted, air conditioned, and with doors which lock, the keys to which shall be provided to the Engineer;
- (c) Each office space shall be equipped with at least 1 desk, 1 desk chair and 2 side chairs and reasonable circulation space;
- (d) Each office space shall have 1 four-drawer filing cabinet or equivalent;
- (e) A plan rack and 4 by 8 foot plan table shall be provided in 1 office space;
- (f) Each office space shall have at least 1 telephone in service;
- (g) Use of a facsimile and copy machine shall be provided for use either in one of the office spaces or in an adjacent office space;
- (h) One office space shall have a computer to the City's criteria with electronic mail capabilities.

**107.20 Meeting Spaces.** Unless otherwise specified in the Contract Documents, the Contractor shall provide adequate space, Equipment and furnishings to conduct progress and coordination meetings for the Project. The meeting area shall be furnished with an appropriate meeting table and an appropriate number of folding or stacking chairs to adequately seat all participants at the meetings.

**107.21 Temporary Heat.** Unless otherwise specified in the Contract Documents, the Contractor shall provide temporary heat necessary so that the Work shall proceed expeditiously during inclement weather, and to protect the Contractor's Work and Materials from damage. From a date of partial occupancy, the City is responsible for the cost of providing heat for the occupied portion of the Project.

**107.22 Water.** Unless otherwise specified in the Contract Documents, the Contractor shall provide all water necessary for the Contractor's Work. From a date of partial occupancy, the City is responsible for the cost of water consumed for the occupied portion of the Project.

**107.23 Hoists and Elevators.** The Contractor shall provide and maintain adequate hoisting and elevator facilities as required for the Contractor's Work in coordination with the Engineer. If electric service requirements of hoisting or elevator facilities differ from that available at the Project site, the Contractor requiring use of such hoisting or elevator facilities shall make

and pay for all necessary connections. Unless otherwise specified in the Contract Documents, the Contractor requiring use of hoisting or elevator facilities, after the Project is enclosed, shall be responsible for transporting individuals and Materials as required for the Contractor's Work.

**107.24 Electricity.** Unless otherwise specified in the Contract Documents, the Contractor shall make all arrangements for temporary light and power services and shall pay all charges, both for service installation and removal, if required, and for energy consumed until Final Acceptance of the Project. Unless otherwise specified in the Contract Documents, the Contractor requiring any electrical service requirements relating to temporary hoists, cranes, welding Equipment or elevators shall subcontract with a licensed Contractor for such service requirements and shall be responsible for all costs of such services. From a date of partial occupancy, the City is responsible for the cost of energy consumed for the occupied portion of the Project.

**107.25 Temporary Facilities.** Unless otherwise specified in the Contract Documents, the Contractor shall provide, and maintain in a clean condition, adequate and approved sanitary facilities for use by all Persons at the Project in coordination with the Engineer.

**107.26 Drainage.** The Contractor shall be responsible for all temporary drainage necessary for the Contractor's Work and shall employ pumps, trenches, drains, sumps or other necessary elements as required to afford satisfactory working conditions for the protection, execution and completion of the Project.

**107.27 Environmental Protection.** The Contractor shall comply with all applicable federal, State and local laws and regulations relating to pollution of the environment and shall take precautions to prevent pollution of water with fuels, oils, bitumens, calcium chloride, sediments and other Materials. When the work area is located in or adjacent to streams and other watercourses, the area shall be separated from the main stream by a dike or barrier to keep sediment from entering the stream. The Contractor shall take care during the construction and removal of such barriers to minimize siltation of the stream and watercourse. Control of ground water and water in excavations shall be accomplished in a manner that will prevent degradation of the quality of any surface water. Wells and well points shall be installed with suitable screens and filters where necessary to prevent the continuous pumping of fines. The discharge of sediment laden water from pumping shall be performed in a manner to prevent degradation of streams, watercourses, lakes, ponds, or other areas of water impoundment. Such prevention may require, without limitation, the use of ditch check dams, sediment traps, sediment basins, sediment pits, filters, filtration bags or other control devices and methods necessary to prevent adverse effects to surface waters as provided in Chapter 3745-1-04 OAC. The cost of constructing and maintaining these measures shall be borne by the Contractor. Water from aggregate washing or other operations containing sediment shall be treated by filtration, settling basins or other measures sufficient to reduce the sediment concentration to not more than that of the stream, watercourse, lake, pond or the area of water impoundment. The Contractor shall not cause or permit the handling or transporting or storage of any material in a manner which allows or may allow unnecessary amounts of particulate matter to become airborne or cause or permit the Project to be constructed, used, repaired or demolished without applying all such reasonable measures as may be required to prevent particulate matter from becoming airborne. The Engineer may require necessary measures to prevent particulate matter from becoming airborne including without limitation the paving or frequent cleaning of roads, driveways and parking lots,

the application of dust-free surfaces, the application of water and the planting and maintenance of vegetative ground cover. When dust, fumes, gases, mist, odorous matter, vapors, or any combination thereof escape from the Project or Equipment in such manner and amount as to cause a nuisance or to violate any regulation, the Engineer may require that the Project or Equipment in which processing, handling and storage are done be tightly closed and ventilated in such a way that all air and gases and air or gas-borne material leaving the Project or Equipment are treated by removal or destruction of air contaminants be discharged to the open air.

**107.28 NPDES General Permit.** The Contractor shall secure any required NPDES general permit by submitting a notice of intent application form to the Ohio EPA at least forty-five Days prior to the start of construction. When required by law, the Contractor shall prepare and certify a storm water pollution prevention plan and process the required notice of termination prior to completion of the Project. The Contractor shall comply with all requirements and conditions of any NPDES general permit, including, but not limited to, implementing and maintaining the control measures specified in the storm water pollution prevention plan, maintaining records of construction activities, and removing Materials no longer required and taking proper action if there is a reportable quantity spill.

**107.29 Building Permits.** Unless otherwise specified in the Contract Documents, the Contractor shall secure the required general building permits. The Contractor shall schedule and attend all intermediate and Final Inspections required for any permit certification. The Contractor shall schedule inspection for occupancy permits with the appropriate local fire authority and State Fire Marshal. The Contractor shall give the Engineer and the Authorized Representative reasonable notice of the date arranged for any inspection.

**107.30 Other Permits.** Unless otherwise specified in the Contract Documents, the Contractor shall apply for, secure and pay the fees for any permit, license or tap in required by State or local authorities having jurisdiction over the Project, except the NPDES permit and the general building permits secured by the Engineer in accordance with 107.29. The Contractor shall give the Engineer and the Authorized Representative reasonable notice of the date arranged for any related inspection.

**107.31 Inspection, Testing and Approval.** Unless otherwise specified in the Contract Documents, the Contractor shall apply for, secure and pay for any inspection, testing or approval required by the Contract Documents, laws, ordinance, rules, regulations or orders of any public authority having jurisdiction over the Project. The Contractor shall give the Engineer and the Authorized Representative reasonable notice of the date arranged for such inspection, testing or approval. The Contractor shall provide an original report of the inspection, testing or approval to the Engineer for approval. If, after the commencement of the Work, the Engineer determines that any portion of the Work requires special inspection, testing or approval, in addition to any inspection, testing or approval provided for or required by the Contract Documents, in order to insure conformance to the Contract Documents, the Engineer may instruct the Contractor in writing to order such special inspection, testing, or approval, or the Engineer may make the arrangements for same. If such special inspection, testing or approval reveals a failure of the Work to comply with the requirements of the Contract Documents, the Contractor shall pay all costs associated with such special inspection, testing or approval. If such special inspection, testing or approval reveals that the Work is in compliance with the Contract Documents, the

Contractor will be paid, by appropriate Change Order, for all costs associated with such special inspection, testing or approval. Neither the observations of the Engineer in the administration of the Contract, nor any inspections, tests or approvals by Persons other than the Contractor shall relieve the Contractor from the Contractor's obligation to perform the Work in conformity with the Contract Documents.

**107.32 Uncovering the Work.** If any Work is covered contrary to the requirements of the Contract Documents or contrary to the written request of the Engineer, such Work must, if required by the Engineer in writing, be uncovered for observation and replaced, if not in conformity with the Contract Documents, and recovered at the Contractor's expense. If any Work has been covered in accordance with the Contract Documents and is Work which the Engineer had not requested the opportunity to observe prior to covering, the Engineer may request that such Work be uncovered by the Contractor. If such Work is found not to be in conformity with the Contract Documents, the Contractor shall pay all costs of uncovering, correcting, replacing, and recovering the Work. If such Work is found to be in conformity with the Contract Documents, a Change Order will be processed to pay the Contractor for the cost of uncovering, correcting, replacing, and recovering the Work, subject to final approval by the City Commission.

**107.33 Correction of the Work.** The Engineer shall notify the Contractor in writing if any Work is found by the Engineer to be Defective, whether observed before or after Contract Completion. The Engineer shall specify in the written notice the time within which the Contractor shall correct the Defective Work. The Contractor shall bear all costs of correcting such Defective Work, including the cost of any consequential damages. If the Contractor fails to correct any Defective Work within the time fixed in the written notice, the City may correct such Work and obtain recovery of all costs, including without limitation any consequential damages, and all attorneys' and consultants' fees, from the Contractor or the Contractor's Surety.

**107.34 Interruption of Existing Services.** Whenever it becomes necessary to interrupt existing services in use by the City or its residents, such as Sewer, water, gas, and steam lines, electric or telephone and cable service, the Contractor shall continue the Work on a non-stop twenty-four hour per Day basis until the Work is completed and the service restored, or at such Alternate time required by the Authorized Representative. Before beginning such Work, the Contractor shall apply in writing to and receive approval in writing from the Authorized Representative and the Person with appropriate jurisdiction over the Project, to establish a time when interruption of the service will cause a minimum of interference with the activities of the City, its tenants, if any, and the public.

**107.35 Clean Up.** During the progress of the Work, the Contractor shall be responsible for the removal and off-site disposal of all waste, excess Materials and rubbish, including without limitation layout stakes, sediment control devices and temporary Structures, attributable to the Work to an appropriate disposal site. Temporary on-site storage of waste, excess Materials and rubbish may be permitted as designated by the Engineer. Unless otherwise provided in the Contract Documents, the Contractor shall perform daily broom cleaning in the area of the Contractor's Work and shall, at the end of each working Day or upon notice from the Engineer, remove all waste Materials and rubbish from the Project. The Contractor shall, as required for the Project or upon notice from the Engineer, clean and remove any waste Materials or rubbish from areas adjacent to the Project. The Contractor shall, as required for the Project or upon

notice from the Engineer, take all necessary actions to minimize and clean dust and mud from the Project and adjacent property in accordance with City ordinances and regulations. If the Contractor fails to clean up during the progress of the Work, the provisions of 105.02 may be invoked. If the Contractor fails to maintain the areas adjacent to the Project clean and free of dust, mud, waste, excess Materials and rubbish, upon written notice from the Engineer, the Authorized Representative shall direct the local jurisdiction having responsibility for the area to clean the area or shall employ City employees or another Person to clean the area. The cost of cleaning the area adjacent to the Project shall be deducted from the Contractor as the Engineer recommends and the Authorized Representative determines to be appropriate. The decision of the Authorized Representative shall be final, subject to proceedings in accordance with 118.01 through 118.11.

**107.36 Explosives and Blasting.** Blasting will not be permitted and explosives may not be brought onto or kept on the site of the Project, except with prior written approval of the Authorized Representative and any other authorities having jurisdiction, including without limitation the City's Fire Department. All blasting and all purchasing, storing and handling of explosives shall be done as prescribed in any applicable federal, State or City statutes, ordinances or regulations by Persons experienced in such Work. The Contractor shall carry appropriate liability insurance and shall be responsible for any injuries to individuals or damage to property resulting from any blasting operation. The Contractor shall provide a copy of the policy of such insurance to the Engineer prior to bringing any explosives to the Project and to the Authorized Representative upon request. The Contractor shall take all necessary precautions to protect the Project, existing or adjacent property, water lines, and other underground Structures from blasting. Where there is danger to Structures or property from blasting, the charges shall be reduced and the material shall be covered with suitable timber, steel or rope mats. The Contractor shall notify all Owners of adjacent or utility property which may be affected of any intention to use explosives at least eight hours before blasting is commenced. Any inspection of use of explosives by the Engineer does not in any way reduce the responsibility of the Contractor or its Surety for damages that may be caused by such use.

**107.37 Emergency.** 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 any threatened damage, injury, or loss. The Contractor shall give the Engineer and the Authorized Representative prompt written notice if the Contractor believes that any significant change in the Work or variation from the Contract Documents has been caused by any emergency or action taken in response to an emergency. If the Engineer recommends that a change in the Contract Documents be made because of any emergency or action taken in response to an emergency, and the Authorized Representative approves, a Change Order will be processed, subject to final approval by the City Commission, if applicable.

**107.38 Royalties and Patents.** 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 which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents and if, to the knowledge of the Engineer, use of the specified item is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the Engineer in the Contract Documents. 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 Authorized Representative.

## ITEM 108 - SUBCONTRACTORS AND MATERIAL SUPPLIERS

### 108.01 Approval by City

### 108.02 Replacement

### 108.03 Contractor's Responsibility

### 108.04 Warranty and Guarantee

### 108.05 Prompt Payment

### 108.06 Prompt Payment Reduction and Interest

### 108.07 Affidavit of Claim

### 108.08 Claims Against Contract Bond

### 108.09 Assignment of Contract

**108.01 Approval by City.** Within ten Days of the Notice to Proceed, the Contractor shall list the Contractor's proposed Subcontractors and Material Suppliers on forms approved by the Authorized Representative and submit such forms to the Engineer for approval by the Authorized Representative. The City reserves the right to reject any Subcontractor or Material Supplier for any reason, in its sole discretion. Failure of the Engineer to notify the Contractor of rejection within ten Days of receipt of the forms shall constitute notice that the City has no objection. If the City rejects any Subcontractor or Material Supplier, the Contractor shall replace the Subcontractor or Material Supplier at no additional cost to the City.

**108.02 Replacement.** The Contractor shall not replace any Subcontractor or Material Supplier after execution of the Contract Form without written approval of the Authorized Representative. The Contractor shall submit to the Engineer amended approval forms and a written justification for the change of the Contractor's Subcontractors or Material Suppliers. The Contractor shall submit to the Engineer amended forms whenever any listed information changes for the Contractor's Subcontractors or Material Suppliers. The City may withhold approval of any such proposed replacement for any reason, in its sole discretion.

The City may require the Contractor to replace any Subcontractor or Material Supplier previously approved at no additional cost to the City if the Contractor is in default because of the Subcontractor's or Material Supplier's performance.

**108.03 Contractor's Responsibility.** The Contractor shall be fully responsible for all acts and omissions of the Contractor's Subcontractors and Material Suppliers and shall be responsible for scheduling and coordinating the Work of the Contractor's Subcontractors and Material Suppliers. Interference, disruption, hindrance, delay or impact attributable to the Contractor's Subcontractors or Material Suppliers shall be deemed to be interference, disruption, hindrance, delay or impact within the control and responsibility of the Contractor. The Contractor shall require that each of the Contractor's Subcontractors have a competent supervisor at the Project whenever Work is being performed by the Subcontractor. The Contractor agrees to bind the Contractor's Subcontractor and Material Supplier to the terms of the Contract Documents, so far as applicable to the Work of such Subcontractor or Material Supplier, and shall not agree to any provisions which seek to bind the City to terms inconsistent with or at variance from the terms of the Contract Documents. Contractor shall require the City to be named as an intended third-party beneficiary of all contracts between Contractor and Subcontractors and Material Suppliers such that the City will be entitled to enforce any rights thereunder to its benefit.

**108.04 Warranty and Guarantee.** The Contractor shall require each Subcontractor and Material Supplier to fully warrant and Guarantee, for the benefit of the City, the effectiveness, fitness for the purpose intended, quality and merchantability of any Work performed or item provided or installed by such Subcontractor or Material Supplier.

**108.05 Prompt Payment.** If a Subcontractor or Material Supplier requests payment in time to allow the Contractor to include the request in the Contractor's Contractor Payment Request, the Contractor shall pay within ten Days after receipt of payment from the City:

- (a) To a Subcontractor an amount equal to percent of completion allowed by the City for the Subcontractor's Work;
- (b) To a Material Supplier an amount equal to all or a portion of the Material Supplier's request for Materials furnished.

**108.06 Prompt Payment Reduction and Interest.** The Contractor may reduce the amount to be paid to a Subcontractor or Material Supplier pursuant to 108.05 by the amount of any retainage withheld from the Contractor and may withhold amounts necessary to resolve disputed liens or claims involving the Work of the Subcontractor or Material Supplier. If the Contractor fails to comply with the provisions of 108.05, the Contractor shall pay to the applicable Subcontractor or Material Supplier eighteen percent interest on any unpaid amount beginning on the eleventh Day after receipt of payment from the City.

**108.07 Affidavit of Claim.** In order to establish lien rights, Subcontractors and Material Suppliers not in privity of Contract with the Contractor must serve a notice of furnishing on the Contractor whose Contract is the Contract under which the Subcontractor or Material Supplier is performing. The notice of furnishing must be served upon the Contractor within twenty-one Days of performing the Work or furnishing the Materials. Subcontractors and Material Suppliers not in privity of Contract with the Contractor must, at the time of filing a Claim Affidavit with the Authorized Representative, provide a copy of the notice of furnishing and proof that it was received by the Contractor. In order to establish lien rights, a claimant must file a Claim Affidavit with the Authorized Representative, within one hundred twenty Days from the date of the last Work or furnishing of Materials. In order to receive priority over similar claims, the claimant must file a copy of the claim with the Montgomery County Recorder's office within thirty Days of serving the Authorized Representative. All claimants who serve the Authorized Representative, and file with the Montgomery County Recorder within thirty Days, have no priority among themselves and share in the funds prorata. Claimants, who file with the Authorized Representative, but not with the Montgomery County Recorder, are paid only if there are sufficient funds left after paying those claimants who file with the Montgomery County Recorder. The Authorized Representative shall notify the Contractor of the receipt of the claim within five Days of receiving the Claim Affidavit. A copy of the Claim Affidavit and a statement advising the Contractor of the Contractor's right to dispute the claim will accompany the notice. The Contractor shall have twenty Days to dispute the claim. If the Contractor does not notify the Authorized Representative in writing of an intention to dispute the claim within twenty Days after receipt of the Claim Affidavit, the Contractor is deemed to have assented to its correctness. The City shall detain the amount stated in the Claim Affidavit from subsequent Contractor Payment Requests and deposit said amount in an escrow

account in accordance with a general escrow agreement between the City and a bank. The escrow agent shall hold the deposit and any interest earned thereon until receipt of notice from the Authorized Representative specifying an amount to be released and the Person to whom the amount is to be released. The City reserves the right to pay a Claim Affidavit which is not timely disputed.

**108.08 Claims Against Contract Bond.** Laborers, Subcontractors or Material Suppliers who have furnished or delivered labor or Materials to the Project may, at any time after performing the labor or delivering the Materials, but not later than ninety Days after Final Acceptance of the Project, by the City, furnish the Surety a statement of the amount due. After furnishing the statement, laborers, Subcontractors or Material Suppliers must wait sixty Days to bring a suit for the amount due. If the Surety has not paid the claim at the expiration of sixty Days, laborers, Subcontractors or Material Suppliers may bring suit for amounts not paid, but must bring the suit within one year of Final Acceptance of the Project, by the City.

**108.09 Assignment of Contract.** The Contractor shall not sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of any right, title or interest therein, without written consent of the Authorized Representative. No sale, transfer, assignment or other disposition of the Contract shall in any case release the Contractor of liability under the Contract and the Contract Bond.

## ITEM 109 CONSTRUCTION PHASE SCHEDULING

- 109.01 Compliance with Schedule**
- 109.02 Responsibility of Contractor**
- 109.03 Preceding Work**
- 109.04 Coordination with City**
- 109.05 Construction Schedule**
- 109.06 Schedule Information**
- 109.07 Construction Schedule Requirements**
- 109.08 Use of Schedule and Float**
- 109.09 Approval and Acceptance Schedule**
- 109.10 Weekly Contractor Reports**
- 109.11 Monthly Progress Reports**
- 109.12 Time Recovery Plan**
- 109.13 Project Meetings**

**109.01 Compliance with Schedule.** The Contractor shall complete portions of the Work in such order and time as provided in the current Construction Schedule.

**109.02 Responsibility of Contractor.** The Contractor shall afford other Persons on the Project reasonable opportunity for the introduction and storage of Materials and Equipment and execution of Work and shall properly connect and coordinate the Contractor's Work with the Work of other Persons on the Project. The Contractor shall perform the Work so as not to interfere with, disturb, hinder, delay, or impact the Work of other Persons on the Project. If the Contractor, or any of the Contractor's Subcontractors or Material Suppliers, causes damage or injury to the property or Work of any other Person on the Project, or by failure to perform the Work with due diligence, delays, interferes with, hinders, disrupts or impacts any other Person on the Project, who suffers damage, injury or expense thereby, the Contractor shall be responsible to the other Person for such damage, injury or expense. Claims, disputes or actions between the Contractor and other Persons on the Project concerning such damages, injury or expense shall not delay completion of the Work which shall be continued by the parties to any such claim dispute or action. The Contractor shall coordinate the Work with the activities and responsibilities of other Persons on the Project, the Engineer and the City to complete the Project in accordance with the Contract Documents. In the event the Contractor fails to prosecute the Work in accordance with the Project Schedule, the Engineer may recommend that the provisions of 105.02 be invoked.

**109.03 Preceding Work.** If any part of the Contractor's Work is preceded by the Work of another Person, the Contractor shall inspect such preceding Work before commencing any Work, and report in writing to the Engineer any defects which render the preceding work unsuitable as related to the Contractor's work. Failure of the Contractor to make such inspection and report in writing shall constitute an acceptance of the preceding work as fit and proper for the reception of the Contractor's work, except for latent defects which such an inspection would fail to disclose.

**109.04 Coordination with City.** The Contractor shall supervise and coordinate the Work in conformity with any coordination from the Engineer and the Authorized Representative, as provided in the Contract Documents. The Contractor shall give reasonable notice to the Engineer

when the Engineer's presence is required for special consultations, decisions or recommendations, as required by the Contract Documents. The Contractor shall consult with the Engineer and the Authorized Representative to obtain full knowledge of all rules, regulations or requirements affecting the Project. The Contractor shall establish the regular working hours, subject to approval by the Engineer and the Authorized Representative. Night working hours and working hours on Sundays and holidays are not permitted without the prior written consent of the Engineer and the Authorized Representative. Such consent will not be provided unless the Contractor has given at least forty-eight hours' notice in writing to the Engineer. The Contractor shall cooperate with the Engineer and the Authorized Representative so as not to interfere with, disturb, hinder or delay the responsibilities of the Engineer and the City.

**109.05 Construction Schedule.** The Contractor shall prepare the Construction Schedule for the Project and a schedule of submittals which is coordinated with the Construction Schedule within thirty Days of the date of the Notice to Proceed or such longer period as mutually agreed between the Engineer and the Contractor in writing upon timely written request by the Contractor. The Contractor shall, within seven Days of the date of the Notice to Proceed, furnish to the Engineer a preliminary Construction Schedule for the prosecution of Work on the Project. The Engineer shall, within seven Days of receipt of the Contractor's preliminary Construction Schedule, provide comments on the preliminary Construction Schedule to the Contractor. The Contractor shall, within five Days of receipt of the comments, prepare a revised Construction Schedule to incorporate those comments and submit the revised Construction Schedule to the Engineer together with all information requested and required by the Engineer. The Engineer shall submit 4 copies of the revised Construction Schedule, together with any recommendation thereon in writing, to the Authorized Representative within three Days of receipt. The Construction Schedule shall not exceed the time limits specified in the Contract Documents and the Notice to Proceed, shall provide for reasonable, efficient and economical execution of the Work and shall be coordinated with the Work of all other Persons or the entire Project to the extent required by the Contract Documents. The Construction Schedule shall be used to plan, organize, and execute the Work, record and report actual performance and progress and show how the Contractor Plans to coordinate all Work to Contract Completion. In preparing the Construction Schedule the Contractor shall use critical path scheduling methods and shall provide without limitation, the information listed in 109.06, unless waived by the Authorized Representative in writing upon the written recommendation of the Engineer.

**109.06 Schedule Information.** In accordance with 109.05, the Contractor shall provide the following information:

- (a) A graphic presentation of the sequence of the Work for the Project which includes, without limitation, the Contractor's resource loading curve in the media and format required by the Engineer;
- (b) Identification of each phase of the Work and any milestone completion dates;
- (c) Identification of activities and durations for all shop drawing and other submittal review and approval, fabrication and review of mock-up Work, product review and procurement, fabrication, shop inspection and delivery including, without limitation, lead time, coordination drawing delivery, Punch List, Punch List corrections, Project close-out requirements, Contract Completion, and occupancy or utilization requirements;

- (d) Identification of disruptions and shutdowns due to other operations, facilities and functions, if any;
- (e) Identification of the critical path of the Work;
- (f) Identification of crew size and total resource hours for each activity in the Construction Schedule;
- (g) The Contractor's signature and date thereof on the Construction Schedule.

**109.07 Construction Schedule Requirements.** The Engineer shall provide complete Specifications for the paper and electronic formats of the Construction Schedule. The Contractor shall develop the Construction Schedule using commercially available Personal computer software acceptable to the Engineer, in graphic and tabular form. Final copies shall be provided in color and in such size as is appropriate for the level of detail and shall clearly and legibly show all relevant information. The Contractor shall provide monthly updates of the Construction Schedule and shall update the Construction Schedule if a time recovery plan is approved in accordance with 109.12, in electronic and paper formats, to the Engineer in graphic and tabular form. All base line and updated schedules shall be submitted electronically to the Engineer, in graphic and tabular form. The Contractor shall provide clear graphics, legends and other necessary data, including without limitation, milestones, constraints and items required by the Project and the Engineer. Unless waived by the Authorized Representative in writing upon written recommendation of the Engineer, each baseline and updated schedule shall show the Project name and Contract and contain lines for signatures and dates of signature for all Contractors involved in the Project. Each baseline and updated schedule shall provide activity identification and a description for each activity broken down to a maximum fifteen Day duration, responsibility of each applicable Contractor, the Contractor's resources and crew size for each activity, early start dates, early finish dates, late start dates, late finish dates, predecessor and successor activities for each activity, free float, total float and percentage completion. Each baseline and updated schedule shall identify the logic relationship between all activities and shall show all submittal dates, coordination drawing preparation, Working Drawing submittals and mark-up review and approval durations. Together with each updated schedule, the Contractor shall provide a list of all changes to the previously approved base line Construction Schedule or the previous updated Construction Schedule, including without limitation logic, float and actual start and finish dates of activities.

**109.08 Use of Schedule and Float.** The Construction Schedule and the Project Schedule, if applicable, shall be used as a tool for scheduling and reporting sequenced progress of the Work using early start dates and early finish dates. Free float and total float are resources of the Project and the use of float associated with an activity is not permitted without the concurrence of the Engineer, and other Contractors, if any.

**109.09 Approval and Acceptance Schedule.** The Contractor shall review and sign each updated Construction Schedule. The Contractor's signature or any base line or updated Construction Schedule shall serve as an affirmation of the Contractor's approval of and agreement to the Construction Schedule and a representation that the Contractor can meet the requirements of the Construction Schedule without additional compensation. Immediately after the Contractor has signed the Construction Schedule, the Engineer shall submit it and the

schedule of submittals to the Authorized Representative or return them to the Contractor with recommendations for revision. In the absence of a Construction Schedule approved by the Contractor and accepted by the Authorized Representative, the City may withhold payment from the Contractor in accordance with 114.08 and 114.09. Alternatively, the City, in its sole discretion, may backcharge the Contractor in accordance with 105.02, reassign scheduling responsibility or suspend or terminate the Contract in accordance with 119.01 through 119.04.

**109.10 Weekly Contractor Reports.** Unless otherwise specified by the Contract Documents, the Contractor shall, on a bi-weekly basis, prepare and submit to the Engineer a written report describing activities begun or finished during the preceding week, work in progress, expected completion of the Work, a Projection of all activities to be started or finished in the upcoming two weeks including without limitation the Contractor's workforce crew size with respect to each activity of Contractor, and total resource hours associated with such Work and any other information requested by the Engineer.

**109.11 Monthly Progress Reports.** Unless otherwise specified in the Contract Documents, the Engineer shall provide monthly progress reports to the Authorized Representative, which shall include recommendations for adjusting the Construction Schedule or the Project Schedule, as applicable, to meet milestone completion dates and Contract Completion dates.

**109.12 Time Recovery Plan.** When it is apparent to the Engineer that critical path activities, scheduled milestone completion dates, or Contract Completion dates will not be met, the Engineer shall submit to the Contractor a time recovery plan to avoid or minimize any delay. A time recovery plan may include, without limitation, increasing the Contractor's workforce in such quantities as will eliminate the backlog of Work, increasing the number of working hours per shift, shifts per workday, workdays per week, the amount of construction Equipment, or any combination thereof, rescheduling of activities to achieve maximum practical concurrency of work efforts and, if appropriate, time extensions. If the Contractor approves the time recovery plan within ten Days of receipt, a revised Construction Schedule shall be prepared by the Contractor and signed and accepted in accordance with 109.11 and, if applicable, a revised Project Schedule shall be prepared by the Engineer and approved and signed by the Contractors in accordance with 109.10. If the Contractor fails to approve a time recovery plan within ten Days of receipt, the Contractor shall immediately provide an Alternate time recovery plan to the Engineer in writing, for review and acceptance in accordance with 109.11 and, if applicable, 109.10.

**109.13 Project Meetings.** The Contractor and all appropriate Subcontractors shall attend Project meetings as requested by the Engineer. The purpose of the Project meetings may include, without limitation, review of progress in the Work, discussion of anticipated progress, and review of critical operations and existing and potential problems and safety matters. The Contractor shall be represented at every Project meeting by a Person authorized with signature authority to make decisions regarding possible modification of the Contract Documents. The Engineer shall notify the Contractor of the time and place of each Project meeting. The Contractor shall have any of the Contractor's Subcontractors and Material Suppliers attend a Project meeting as deemed advisable by the Contractor or as requested by the Engineer. The Engineer or the Engineer's designated representative shall prepare a written report of each Project meeting and distribute such report to the Authorized Representative and the Contractor. The Engineer or the Engineer's designated representative, as applicable, shall not delegate the duty to prepare a

written report of each Project meeting. If any Person objects to anything in a report of a Project meeting, the Person shall notify the Engineer, the Authorized Representative and any other affected Person in writing explaining the objection. The Engineer shall attach any objection made to a report of a Project meeting and any response thereto to the report.

## ITEM 110 - WORKING DRAWINGS AND SAMPLES

- 110.01 Requirement to Provide**
- 110.02 Samples, Tests, Cited Specifications**
- 110.03 Source Sampling and Testing**
- 110.04 Form of Submittals**
- 110.05 Variation from Contract Documents**
- 110.06 Contractor's Review**
- 110.07 Engineer's Review**
- 110.08 Risk of Nonpayment**
- 110.09 Manufacturer's Statement**

**110.01 Requirement to Provide.** Working Drawings, Samples and other submittals, including without limitation stress sheets, erection Plans, falsework Plans, cofferdam Plans, bending diagrams for reinforcing steel, formwork, Plans, and tunneling Plans, shall be provided by the Contractor for any item required by the Contract Documents but not fully described in the Drawings and Specifications, unless waived by the Engineer, and shall include, without limitation:

- (a) Construction of the various parts, method of jointery, type of material, grade, quality and thickness of material, alloy of material, profiles of all sections, reinforcement, anchorage, type and grade of finish;
- (b) Capacities, types of Materials and performance charts that are pertinent to the Materials and performance charts that are pertinent to the Work. Wiring diagrams, control diagrams, schematic diagrams, working and erection dimensions, arrangement and Specifications;
- (c) Notwithstanding any measurements in Drawings or Specifications, where the Work involves repair, renovation, extension or alteration of, or addition to, an existing Structure, the Contractor shall make such measurements of the existing Structure as may be required to accurately attach the Work to the Structure.

**110.02 Samples, Tests, Cited Specifications.** Unless otherwise provided in the Contract Documents, the City shall test Samples of Materials in accordance with AASHTO, ASTM, AWWA or methods on file in the office of the Director at the expense of the City. Samples will be taken by a qualified representative of the City. References included in these Specifications to AASHTO, ASTM, AWWA, or federal Specifications shall be to the test method, sampling method or specification in effect upon the date of the notice to Bidders for the Contract. Copies of all test results will be furnished to the Contractor. The Contractor shall cooperate fully in the sampling and inspection of Materials and shall notify the Engineer immediately upon the arrival of Materials to be used in the Work. The City reserves the right to retest all Materials and Equipment that have been stored prior to incorporation of those Materials into the Project and to reject all Materials and Equipment which, when retested, do not meet the requirements of the Contract Documents. The Contractor, in all cases, shall furnish the required Samples without charge. Transports and distributors hauling bituminous material shall be equipped with an approved submerged bituminous Materials sampling device.

**110.03 Source Sampling and Testing.** The Engineer may undertake the sampling and testing of Materials at the source of supply. If source sampling and testing is undertaken:

- (a) The Contractor shall cooperate and assist the Engineer, including without limitation in compliance with applicable inspection, sampling and test requirements, and shall provide all necessary documentation;
- (b) The Contractor shall provide full entry at all times to the parts of the source as may concern the manufacture or production of the Materials being sampled and tested;
- (c) If required by the Engineer, the Contractor shall arrange for an approved building for the use of the inspection which building shall be located conveniently near the source and independent of any building used by the Materials producer;
- (d) The Contractor shall provide and maintain adequate safety measures at the plant at all times;
- (e) The City reserves the right to retest all Materials that were tested at the source prior to the incorporation of those Materials into the Project and to reject all Materials which, when retested, do not meet the requirements of the Contract Documents.

**110.04 Form of Submittals.** The Contractor shall provide a submittal letter and shall stamp and submit the working Drawings or other submittals to the Engineer in accordance with a schedule established by the Engineer and the Contractor. Unless otherwise specified in the Contract Documents, the Contractor shall submit 3 prints of all working Drawings and 4 copies of any other submittal. Only 1 print copy of all working Drawings will be returned to the Contractor by the Engineer. If the Contractor requires more than 1 copy, additional copies must be provided to the Engineer at the time of the original submission. The Engineer will not produce copies of the working Drawings. The data shown on the working Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, Materials and similar data to show the Engineer the Materials and Equipment which the Contractor proposes to provide. Each sample shall be identified clearly as to material, supplier, and pertinent data such as catalog numbers and the use for which intended and other uses as the Engineer may require to enable the Engineer to intelligently review the submittal. All working Drawings shall indicate the applicable plan sheet and Specifications.

**110.05 Variation from Contract Documents.** If the working Drawings or other submittals show variations from the requirements of the Contract Documents, the Contractor shall make specific mention of such variations in the Contractor's letter of submittal to the Engineer. If the variation is acceptable to the Engineer, the Engineer shall recommend acceptance of the variation to the Authorized Representative in writing. Upon written approval of the Authorized Representative, the variation shall be incorporated into the Contract Documents. The Contractor shall not be relieved of any responsibility for deviations from the requirements of the Contract Documents by the Engineer's review of working Drawings, Samples or other submittals.

**110.06 Contractor's Review.** All working Drawings, Samples and other submittals shall be reviewed and stamped by the Contractor prior to submittal to the Engineer. If it is apparent to the Engineer that the Contractor has not reviewed the submittals, or has conducted an incomplete

review, the Engineer shall reject the submittals. The Contractor shall field verify conditions as necessary and make corrections of dimensions, location of various items, encroachments of Work or variations from the requirements of the Contract Documents. If required by the Contract Documents or applicable law, the Contractor shall have the working Drawings or other submittals prepared by Persons possessing expertise and experience in an appropriate trade or profession or by a licensed Engineer, landscape architect, or other design professional.

**110.07 Engineer's Review.** The Engineer shall review and approve or disapprove working Drawings, Samples or other submittals within fifteen Days of receipt or in accordance with the approved submittal schedule or such other period of time as is mutually agreed by the Engineer and the Contractor. The Contractor shall make any corrections required by the Engineer and shall resubmit the required number of corrected copies of working Drawings, Samples or other submittals until approved, which resubmission shall be acted upon by the Engineer with fifteen Days of receipt or such other period of time as is mutually agreed by the Engineer and the Contractor. When resubmitting submittals, the Contractor shall direct the Engineer's attention to any revisions made by noting such revisions on the resubmitted submittal. All costs incurred by the Engineer, the City or other Persons due to the failure of the initial submittal to substantially meet the requirements of the Contract Documents, or due to excessive resubmittals, for attendant delay, interference, hindrance, disruption or impact of the Project, shall be paid by the Contractor. Resubmittals in excess of two may be deemed excessive by the City. The Engineer's review and approval of working Drawings, Samples and other submittals is to determine if the items covered by such 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. The Engineer's review and approval shall not extend to means, methods, manners, techniques, sequences, procedure of construction or to safety precautions or programs incident thereto. The Engineer's review and approval of a separate item will not indicate approval of the assembly in which the item functions.

**110.08 Risk of Nonpayment.** No portion of the Work requiring a Working Drawing, sample or other submittal shall be commenced until the submittal, has been reviewed and approved by the Engineer. Any Work commenced by the Contractor prior to final approval of the Working Drawing, sample or other submittal by the Engineer shall be performed by the Contractor under risk that no payment will be approved or made by the City for such Work.

**110.09 Manufacturer's Statement.** Working Drawings on all Equipment shall include the following written statement from the manufacturer of the Equipment:

"This Equipment submitted for approval shall perform as specified when installed by the Contractor in the arrangement shown on this drawing and in the Contract Documents and in conjunction with all other accessories such as flues, breachings, piping, controls and Equipment not furnished by this manufacturer but required as an accessory or supplement to this Equipment, providing that the accessory or supplementary items perform as specified and are installed as shown in the Contract Documents."

## ITEM 111 PREVAILING WAGE RATES

### 111.01 Prevailing Wages

### 111.02 Prevailing Wage Determination

### 111.03 Fines and Penalties

### 111.04 Wage Schedule

### 111.05 Payroll Reports

**111.01 Prevailing Wages.** The Contractor shall pay the prevailing wage rates of the Project locality, as determined by the Ohio Department of Commerce, Division of Labor and Worker Safety, Wage and Hour bureau, or the U.S. Department of Labor to laborers and mechanics performing Work on the Project, as applicable. The Contractor shall comply with the provisions, duties, obligations, and is subject to the remedies and penalties of Sections 4115.03 to 4115.22, ORC or the Davis-Bacon Act, as applicable.

**111.02 Prevailing Wage Determination.** The Contract Documents include pages setting forth the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Division of Labor and Worker Safety, Wage and Hour Bureau, or the U.S. Department of Labor for the Project, as applicable. The City shall, within seven business Days after receipt of a notice of a change in the prevailing rates, notify the Contractor of the change. The Contractor shall make the necessary adjustment in the prevailing wage rate and shall pay any wage increase during the term of the Contract.

**111.03 Fines and Penalties.** Whoever violates Section 4115.08 or 4115.09, ORC, shall be fined pursuant to the applicable provisions of the Ohio Revised Code. Whoever violates division (C) of Section 4115.071, or Section 4115.10 or 4115.11, ORC is guilty of a misdemeanor of the second degree for a first offense. For each subsequent offense such Person is guilty of a misdemeanor of the first degree. Fines and penalties under the Davis-Bacon Act shall be as determined by the U.S. Department of Labor and in accordance with applicable law.

**111.04 Wage Schedule.** Within ten Days of the date of the Notice to Proceed, the Contractor shall provide the City's prevailing wage Coordinator a schedule of dates during the term of the Contract on which wages will be paid to employees for the Project.

**111.05 Payroll Reports.** The Contractor shall submit weekly payroll reports with each Contractor Payment Request, which reports shall be certified by the Contractor that the payroll is correct and complete and the wage rates shown are not less than those required by the Contract. The Contractor shall be responsible for submitting all payroll reports of the Contractor's Subcontractors. The payroll report shall indicate the week covered and shall include a list containing the name, address and social security number of each employee of the Contractor and the Contractor's Subcontractors paid for the Work. The 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, fringe benefits and all deductions from wages and net pay. The payroll report shall also list each fringe benefit and state if it is paid as cash to the employee or to a named plan. The Contractor and the Contractor's

Subcontractors shall also submit apprenticeship agreements for all apprentices utilized on the Project.

## ITEM 112 INSURANCE

### 112.01 Contractor's Liability Insurance

### 112.02 Policy Limits

### 112.03 Explosion, Collapsed and Underground Insurance

### 112.04 Builder's Risk Insurance

### 112.05 Coverage Amount

### 112.06 Railroad Protective Insurance

### 112.07 Insurance Policy Requirements

### 112.08 Renewal Certificates

### 112.09 Waivers of Subrogation

**112.01 Contractor's Liability Insurance.** The Contractor shall purchase and maintain such liability and other insurance as will protect the Contractor from claims described below which may arise out of or result from the Contractor's performance or obligations under the Contract Documents, whether due to action or inaction by the Contractor, a Subcontractor, any Person directly or indirectly employed by the Contractor or a Subcontractor or any Person for whom the Contractor or a Subcontractor is responsible, or by any Person for whose acts the Contractor or a Subcontractor may be liable:

- (a) Claims under workers' compensation, occupational sickness or disease, disability benefit and other similar employee benefit acts;
- (b) Claims for damages because of bodily injury, disease, illness, death or Personal injury, and other claims usually covered by bodily injury liability insurance;
- (c) Claims for damages because of injury to or destruction of property and other claims usually covered by property damage liability insurance.

The Contractor shall comply with all provisions of the Ohio Workers Compensation Act and all rules of the Ohio Bureau of Workers' Compensation. In addition, if a portion of the Work is performed from a barge or a ship or requires unloading Materials from a barge or a ship on a navigable waterway of the United States, the Contractor shall arrange coverage for that portion of the Work under the Longshore and Harborworkers' Compensation Act, 33 U.S.C. Section 901, et seq., and the Jones Act, 5 U.S.C. Section 751, et seq. and shall provide proof of such coverage to the City. Comprehensive Automobile Liability Insurance shall cover owned, non-owned and hired vehicles.

**112.02 Policy Limits.** A Commercial General Liability policy and Business Automobile Liability policy shall be maintained to provide insurance as described below. An Umbrella or Excess Liability policy may be used in combination with the Commercial General Liability and business Automobile insurance to meet such limits:

- (a) Policy Limits Commercial General Liability**
  - \$2,000,000 General Aggregate
  - \$2,000,000 Products/Completed Operations Aggregate
  - \$1,000,000 Occurrence Limit
  - \$1,000,000 Personal and Advertising Injury Limit
  - \$100,000 Fire Legal Liability Limit
  - \$10,000 Medical Payments
  
- (b) Policy Limits Comprehensive Automobile Liability**
  - \$1,000,000 Bodily Injury & Property Damage Occurrence Limit

Contracts in the amount of one hundred thousand dollars or less shall require coverage in the amount of not less than two million dollars general aggregate and one million dollars per occurrence. Contracts in excess of one hundred thousand dollars, but not more than five million dollars shall require coverage in the amount of not less than three million dollars general aggregate and per occurrence. Contracts exceeding the amount of five million dollars shall require coverage in an amount to be determined by the Authorized Representative but in no case less than five million dollars general aggregate and per occurrence. Such policies shall be endorsed to provide that the General Aggregate Limit applies separately to each of the insured Contractor's Projects. By requiring such insurance and insurance limits herein, the City does not represent that coverage and limits will necessarily be adequate to protect the Contractor, and such coverage and limits shall not be deemed as a limitation on the Contractor's liability under the indemnities granted to the City.

**112.03 Explosion, Collapsed and Underground Insurance.** For any demolition, excavating, tunneling, shoring or similar operations, the Contractor shall purchase and maintain Explosion, Collapse and Underground (XCU) coverage with a limit of liability equal to such limit as specified in 112.02. In addition, if blasting is to be performed, the Contractor shall purchase and maintain XCU coverage providing a minimum Aggregate Limit of 5,000,000 dollars and Each Occurrence Limit of 1,000,000 dollars.

**112.031 Pollution Liability Insurance.** If required by the Contract Documents, Contractor shall purchase and maintain pollution liability insurance with a limit for any one incident of not less than \$1,000,000 and an aggregate limit of not less than \$2,000,000.

**112.032 Completed Operations Insurance.** Contractor shall purchase and maintain completed operations coverage to cover such claims for bodily injury or property damage arising out of the Contractor's completed operations, which coverage shall be maintained for no less than five (5) years following final payment.

**112.04 Builder's Risk Insurance.** Unless otherwise specified in the Contract Documents, the Contractor shall provide and maintain, during the progress of the Work and until the execution of the Certificate of Contract Completion by the Authorized Representative, a builder's risk insurance policy to cover all Work in the course of construction including falsework, temporary buildings and Structures and Materials used in the construction process, stored on or off site, or while in transit. The amount of coverage shall equal the total completed value of the Project (including the value of permanent fixtures and decorations). Such insurance shall be on a special cause of loss form, which provides coverage on an open perils basis insuring against the direct physical loss of or damage to covered property including flood and earthquake. It shall also include debris removal and demolition occasioned by enforcement of any applicable legal requirement, and shall cover reasonable compensation for the City's services and expenses required to limit further loss. Coverage must include provision to pay the reasonable extra costs of expediting temporary and permanent repairs to, or permanent replacement of, damaged property. This shall include overtime wages and the extra cost of "express" or other means for rapidly transporting Materials, Equipment and supplies necessary to such repair or replacement. The builder's risk policy shall protect both the Contractor and the City from loss and provide coverage for Materials in transit or stored off site and identified for the Project. Coverage for other perils may be required if specified in the Special Provisions.

**112.05 Coverage Amount.** Unless otherwise specified in the Contract Documents, the builder's risk policy shall be written in the amount equal to one hundred percent of the Contract price, including landscaping, paving and other sitework. The builder's risk policy shall specifically permit and allow for partial occupancy by the City prior to Final Acceptance of the Project by the City.

**112.06 Railroad Protective Insurance.** Where the Contract requires railroad Protective Insurance and no specific Bid item is provided in the Proposal for the payment of the premium therefore, the cost of such insurance shall be included in the various other Bid items in the Contract.

**112.07 Insurance Policy Requirements.** Each policy of insurance required to be purchased and maintained by the Contractor shall be obtained from an insurance company authorized by the Ohio Department of Insurance to do business in the State and shall name the City as an additional insured or loss payee, as applicable; provided, however, that such designation shall not cause any claim between the Contractor and the City to be waived except as set forth in 112.09. Each policy and the respective certificate of insurance shall expressly provide that no less than thirty Days prior written notice shall be given to the City in the event of cancellation, non-renewal, expiration or material alteration of the coverage contained in such policy or evidenced by such certificate of insurance. Each policy shall provide that the City shall be covered notwithstanding any action, omission or negligence of the Contractor. Each policy shall be primary and non-contributory. Each policy must include contractual liability insurance covering the Contractor's indemnity obligations. The Contractor shall furnish the City, when requested, a certified copy of any insurance or additional insured or loss payee endorsement required to be purchased or maintained by the Contract Documents. In no event shall any failure of the City to demand a certified copy of any required insurance or endorsement be construed as a waiver of the obligation of the Contractor to obtain insurance required to be purchased or maintained by the Contract Documents. Except for its completed operations insurance, the Contractor shall maintain all insurance in the required amounts, without interruption, from the date

of the execution of the Contract Form until the date of approval of the Certificate of Contract Completion by the Authorized Representative. The Contractor shall require all Subcontractors to provide Workers' Compensation, CGL, and Automobile Liability insurance with the same minimum limits specified herein, unless the Owner agrees to a lesser amount and require the City be named as an additional insured and/or loss payee under such policies. Failure to maintain the required insurance during the time specified shall be cause for termination of the Contract. If the Contractor fails to purchase and maintain, or require to be purchased and maintained, any insurance required under these Specifications, the Owner may, but shall not be obligated to, upon three (3) days written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to be reimbursed by the Contractor upon demand. Insurance policies required to be purchased and maintained by the Contractor may include a reasonable loss deductible and exclusions, which shall be the responsibility of the Contractor to pay in the event of loss. The prompt repair or reconstruction of the Work as a result of an insured loss or damage shall be the Contractor's responsibility and shall be accomplished at no additional cost to the City.

**112.08 Renewal Certificates.** If the Contractor provides certificates of insurance showing expiration prior to the date of final completion, the Contractor shall provide new certificates to the City showing continuing coverage prior to expiration.

**112.09 Waivers of Subrogation.** The City and the 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 obtained pursuant to Item 112 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the City as fiduciary.

## ITEM 113 INDEMNIFICATION

### 113.01 Indemnification for Injury or Damage

### 113.02 Indemnification for Patent or Copyright Use

**113.01 Indemnification for Injury, Damage or Breach of Contract.** To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the City, the Engineer, any participating railroad or railway company, any property Owner or lessee of adjacent property, or utilities and any private Person providing financing for the Project, their respective members, officials, officers, consultants, agents, representatives and employees, in both individual and official capacities, from and against all claims, damages, losses, and expenses, direct, indirect or consequential, including but not limited to all fees and charges of design professionals, attorneys, and other professionals and all court, arbitration, or other dispute resolution costs, arising out of or resulting from any claim or action, legal or equitable, caused or alleged to have been caused by the Contractor's performance of the Work or any breach of the Contractor's obligations under the Contract Documents, including but not limited to the breach of any warranty provided in the Contract Documents.

In the event of any such injury, including death, or loss or damage, or claims therefore, the Contractor shall give prompt notice thereof to the Engineer and the Authorized Representative. This provision is intended to be, and shall be construed, as consistent with, and not in conflict with, Section 2305.31 ORC, to the fullest extent permitted. The indemnification obligations of the Contractor under this 113.01 shall not extend to the liability of the Engineer, the Engineer's officials, consultants, agents, representatives or employees for negligent preparation or approval of Drawings, specification, Change Orders, opinions, and any other responsibility of the Engineer, except to the extent covered by the Contractor's insurance.

**113.02 Indemnification for Patent or Copyright Use.** To the fullest extent permitted by law, the Contractor shall indemnify, hold harmless and defend the City and the Engineer, their respective members, officials, officers, consultants, agents, representatives and employees, in both individual and official capacities from and against all claims, damages, losses and expenses arising out of the Contractor's infringement of patent rights or copyrights.

## ITEM 114 CONTRACTOR PAYMENT

- 114.01 Contract Cost Breakdown**
- 114.02 Contractor Payment Request**
- 114.03 Payment Date**
- 114.04 Labor Payments**
- 114.05 Material Payments**
- 114.06 Retainage**
- 114.07 Retainage Reduction with Consent of Surety**
- 114.08 Payments Withheld**
- 114.09 Payments Detained**
- 114.10 Measurement of Quantities**
- 114.11 Final Payment Request**
- 114.12 Final Payment Date**
- 114.13 Waiver of City's Claims**
- 114.14 Waiver of Contractor's Claims**

**114.01 Contract Cost Breakdown.** The Contractor shall submit to the Engineer a full, accurate and detailed estimate (the Contract Cost Breakdown) of the various kinds of labor to be performed and material to be furnished, with separate amounts shown for labor and Materials for each branch of Work, following the preferred titles and sequences of sections in the format used by the Engineer in developing the Specifications. The grand total shown on the Contract Cost Breakdown must equal the total Contract price. The City reserves the right to use the approved Contract Cost Breakdown to determine the cost or credit resulting from any change in the Work. The first item should be actual aggregate cost of Contract Bond, insurance, permits and tests required for the Work. The amounts for labor and material shall accurately reflect the cost for each item. Separate items shall not be shown for overhead or profit, but shall be included in the totals for labor and Materials. Whenever the material allocation exceeds fifty-five percent of the Contract price, the Contractor shall provide, upon request, sufficient information to support such higher percentage. Subcontract Work shall show amounts for labor and Materials. Fringe benefits shall be shown as a part of labor costs. When more than one major Structure is included in the Contract, the Contract Cost Breakdown shall be subdivided accordingly if requested by the Engineer, with cost details for each Structure shown separately. A line item shall be included for commissioning, Punch List Work, Project record document submittals, delivery of inventory and specified training. The Contract Cost Breakdown will be returned to the Contractor for resubmittal if it does not meet the requirements set forth above or contains insufficient items or details of the Work. No payment will be made without an approved Contract Cost Breakdown.

**114.02 Contractor Payment Request.** The Contractor shall submit monthly to the Engineer an itemized Payment Request for Work performed based upon the Contract Cost Breakdown on a form satisfactory to the Authorized Representative. The Contractor Payment Request shall be supported by documentation substantiating the Contractor's right to payment. The Contractor shall supply any additional documentation the Engineer may request in connection with each payment to the Contractor. Certified payroll reports for the period of time indicated shall be attached to one copy of every Payment Request. The Contractor shall list on the Contractor Payment Request any approved Change Orders processed and performed during the time covered by the Payment Request.

**114.03 Payment Date.** Payment of an approved Payment Request shall be made within thirty Days from the date of approval by the Engineer. The City reserves the right to require proof of the renewal of required insurance as a condition precedent to payment. Payments due and not paid to the Contractor within such thirty Day period shall bear interest from the date payment is due under the Contract Documents at the rate paid by the STAR Account in accordance with 120.04. The amount of Liquidated Damages to which the City is apparently entitled under the Contract Documents may be deducted from any Payment Request by the Engineer and the Authorized Representative.

**114.04 Labor Payments.** Partial payments to the Contractor for labor performed under either a Unit Price or lump sum Contract shall be made at the rate of ninety percent of the amount invoiced through the Payment Request which shows the total Contract Completion at fifty percent or greater. After the Contract is fifty percent complete, as evidenced by payments in the amount of at least fifty percent of the Contract price to the Contractor, partial payments for labor performed under either a Unit Price or lump sum Contract shall be made at the rate of ninety-five percent of the amount involved.

**114.05 Material Payments.** Through the Payment Request which shows total Contract Completion at fifty percent or greater, the City shall pay to the Contractor a sum at the rate of ninety percent of the invoice cost, not to exceed the applicable Bid amount in a Unit Price or lump sum Contract, for material delivered on the site of the Project, or other point in the vicinity of the Project, or other storage site approved by the Engineer, provided the Contractor provides the following information with the Payment Request:

- (a) 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;
- (b) A certification of Materials stored off site, prepared by the Contractor and signed by the Engineer 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. All costs incurred by the Engineer to visit a storage site, other than the areas adjacent to the Project, shall be paid by the Contractor.

After the Contract is fifty percent complete, as evidenced by payments in the amount of at least fifty percent of the Contract price to the Contractor, partial payments for Materials furnished under either a Unit Price or lump sum Contract shall be made at the rate of ninety-five percent of the amount involved. When payment is allowed on account of material delivered on the site of the Project or in the vicinity thereof or under the possession and control of the Contractor but not yet incorporated therein, such material shall become the property of the City, but if such material is stolen, destroyed, or damaged by casualty before being used, the Contractor will be required to replace it at the Contractor's expense. Any such material not ultimately incorporated into the Project may, at the option of the City, be retained by the City or returned to the Contractor for credit to the City of a proportionate amount. Completed line items concealed, underground and buried and not subject to final Punch List may be paid for at the rate of one hundred percent. Such completed line items subject to a final Punch List requiring testing or start-up shall be paid at the rate of ninety-eight percent.

**114.06 Retainage.** The City will not deposit retainage in any escrow account and will not pay interest on retainage. Any contrary provisions of 153.12, 153.13, 153.14 and 153.63, ORC, do not apply to this Contract. Payment of retainage to the Contractor shall not be due until thirty Days after approval of a final Contractor Payment Request by the City and execution of the Certificate of Contract Completion by the City. Any reduction or release of retainage, or portion thereof, shall not be a waiver of the City's right to retainage in connection with other payments to the Contractor, or any other right or remedy the City has under the Contract Documents, at law or in equity.

**114.07 Retainage Reduction with Consent of Surety.** Upon consent by the Contractor's Surety, the City may reduce the amount of funds retained for the faithful performance of Work by fifty 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 without limitation, the following:

- (a) Completion of the Work;
- (b) All interference, disruption, hindrance, delay and impact claims;
- (c) All Liquidated Damages; and
- (d) All additional expenses incurred by the City.

**114.08 Payments Withheld.** The Engineer shall have the authority to recommend to the City that payments be withheld from, or Liquidated Damages be assessed against and withheld from, a Payment Request, stating the reasons for such recommendation. The City reserves the right to decline to approve any Contractor Payment Request or part thereof, or because of subsequent evidence or inspection, may nullify any previous Payment Request, in whole or in part, to such extent as may be necessary in the Authorized Representative's opinion to protect the City from loss because of:

- (a) Defective Work not remedied;
- (b) Damage caused by the Contractor;
- (c) Failure to comply with the requirements of Sections 4115.03 to 4115.22, ORC or the Davis-Bacon Act as applicable; and/or
- (d) Liquidated Damages.
- (e) Other damages the City has incurred or is expected to incur due to Contractor's fault.

If a basis for withholding payment is removed, payment shall be made for the amount withheld because of the basis.

**114.09 Payments Detained.** Whenever the City receives a Claim Affidavit, the Authorized Representative shall detain the stated amount from the Contractor's subsequent Payment Requests unless the Contractor provides a release and waiver of lien with a Payment

Request. The release and waiver of lien shall be executed by the Person supplying labor, Materials or services on a Project, which has or may have a right of claim against the Contractor's proceeds. If the City detains an amount as set forth above, such action shall not be construed as conferring any right on such Subcontractor or Material Supplier, nor as enlarging or altering the application or effect of the existing lien law.

**114.10 Measurement of Quantities.** For all Contracts, except lump sum Contracts, after an item of the Work is completed and before final payment is made by the City, the Engineer will determine the quantities of various items of Work performed as the basis for final payment. The Contractor, in case of Unit Price items, will be paid as provided in 103.19. After issuance of a Certificate of Contract Completion in accordance with 115.05, the Engineer shall prepare a final estimate for payment based on the actual quantities of completed Work and deducting there from all previous payments made to the Contractor. Any prior estimate is subject to correction in the final estimate.

**114.11 Final Payment Request.** The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and to final payment, shall provide all documents required pursuant to 115.06 for approval by the Engineer with the Contractor's final Payment Request.

**114.12 Final Payment Date.** Payment of the final Payment Request shall be made within thirty Days from the date of approval by the Engineer unless the City has reason to withhold amounts pursuant to the terms of this Agreement. Payments due and not paid to the Contractor within such thirty Day period shall bear interest from the date payment is due under the Contract Documents at the rate paid by the STAR Account in accordance with 120.04.

**114.13 Waiver of City's Claims.** The making of final payment by the City shall constitute a waiver of claims by the City except those relating to unresolved claims of the Contractor or the City and those arising after Contract Completion including, without limitation, the following:

- (a) Defective or nonconforming Work;
- (b) Error by Contractor;
- (c) Outstanding liens, claims, security interests, or other encumbrances arising out of the Contract Documents and unsettled;
- (d) Failure of the Contractor to comply with any warranties or Guarantees required by the Contract Documents;
- (e) audits performed by the City after final payment;
- (f) any claims, damages, losses, or expenses for indemnification under Item 113;
- (g) Inadvertent overpayment by the City.

**114.14 Waiver of Contractor's Claims.** The acceptance of final payment by the Contractor shall constitute a waiver of all claims against the City except those that the Contractor has previously made in writing in accordance with 118.01 through 118.11 and which remain unresolved at the time of final payment. This provision is intended to be, and shall be construed as, consistent with, and not in conflict with, Section 4113.62 ORC, to the fullest extent permitted.

## **ITEM 115 FINAL INSPECTION AND ACCEPTANCE**

- 115.01 Contractor's Request**
- 115.02 Engineer's Punch List**
- 115.03 Completion and Correction of Punch List Items.**
- 115.04 Deferred Items**
- 115.05 Certificate of Contract Completion**
- 115.06 Project Record Document Submittals**
- 115.07 Record Drawings**
- 115.08 Guarantee**
- 115.09 Warranty**
- 115.10 Exercise of Guarantee or Warranty**
- 115.11 Final Cleaning**
- 115.12 Final Cleaning Remedies**
- 115.13 Work After Final Cleaning**

**115.01 Contractor's Request.** When the Work or a designated portion thereof, is nearly complete, the Contractor shall submit a request for a Final Inspection of the Work ("the "Final Inspection") to the Engineer in writing.

**115.02 Engineer's Punch List.** The Engineer shall, within seven Days of receipt of the request for Final Inspection, notify the Contractor of acceptance or rejection of the request for Final Inspection, stating reasons for any rejection. Upon acceptance of the Contractor's request, the Engineer shall conduct the Final Inspection to determine whether the Work or the designated portion thereof, is in conformity with the Contract Documents. The Engineer shall notify the Contractor and the Authorized Representative of the scheduled time of the Final Inspection. Within three Days of the Final Inspection, the Engineer shall notify the Contractor of any items of Work remaining in a Defective, incomplete or unacceptable condition. The list of such items shall be known as the Engineer's Punch List.

**115.03 Completion and Correction of Punch List Items.** Within fourteen Days of receipt of the notice required by 115.02, the Contractor shall complete and correct all items on the Engineer's Punch List. If the Contractor does not complete the items on the Engineer's Punch List within fourteen Days of receipt of the notice, the provisions of 105.02 may be invoked. If the Work on the Engineer's Punch List cannot be completed within fourteen Days of receipt of the notice, the Contractor shall justify to the reasonable satisfaction of the Engineer the reasons the items cannot be so completed, and the Contractor shall propose, for approval of the Engineer, a time when such items will be completed. If the Contractor fails to timely correct the items on the Punch List, the City, in its discretion, may perform the Work by itself or others and the cost thereof shall be charged against the Contractor. If the balance of the Contract price is insufficient, the Contractor and/or its surety will pay the Owner the balance on demand. The Contractor's warranties and obligations under the Contract Documents shall remain in full force and effect and cover any remedial work even if performed by others. Failure of the Engineer to include any items on the Engineer's Punch List shall not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents. If multiple inspections of items on the Engineer's Punch List are required due to the Contractor's failure to properly and timely complete

them, the Contractor shall be responsible for any additional costs incurred by the Contractor, other Persons, the Engineer and the City resulting from any attendant delay.

**115.04 Deferred Items.** With the approval of the Engineer, when upon Final Inspection, items of Work cannot be completed because of seasonal conditions, such as bituminous paving or landscaping, or if the Authorized Representative agrees that a particular item need not be completed until a subsequent date, the Authorized Representative may release payment to the Contractor less twice the cost of completing the remaining Work as determined in the sole discretion of the Authorized Representative.

**115.05 Certificate of Contract Completion.** When all items on the Engineer's Punch List have been corrected to the satisfaction of the Engineer and the provisions of 115.06 through 115.14 have been fulfilled, the Engineer shall process a Certificate of Contract Completion for execution by the Authorized Representative. The City reserves the right of Final Acceptance of the Project.

**115.06 Project Record Document Submittals.** The Contractor, as a condition precedent to execution of the Certificate of Contract Completion, release of retainage and final payment, shall provide all Project record documents to the Engineer for approval, which may include, without limitation:

- (a) Certificate of occupancy, if required;
- (b) Any inspection certificates required such as pressure piping, elevator, boiler, electrical, plumbing or piping purification;
- (c) Letter of Approval for fire suppression system, if required;
- (d) Any operating and maintenance manuals, which shall be organized into suitable sets of manageable size. Indexed data shall be bound in individual binders, with pocket folders for folded sheet information and appropriate identification shall be marked on the front and the spine of each binder;
- (e) Neatly and accurately marked sets of As-built Drawings and other Contract Documents reflecting the actual construction of the Project;
- (f) Reproducible detailed Drawings reflecting the exact location of any concealed utilities, mechanical or electrical systems and components;
- (g) Assignment to the City of all warranties and guaranties, including the most recent address and telephone number of any Subcontractors, Material Suppliers, or manufacturers;
- (h) An affidavit from the Contractor to certify that all Subcontractors and Material Suppliers have been paid in full for all Work performed or Materials furnished for the Project and an affidavit from each Subcontractor and Material Supplier that the Subcontractor or Material Supplier has been paid in full for all Work performed or Materials furnished for the Project;
- (i) Final certified payroll reports;

(j) Affidavit to certify that the Contractor and an affidavit from each Subcontractor to certify that the Subcontractor has complied with all requirements of Sections 4115.03 to 4115.22, ORC, or the Davis-Bacon Act, as applicable.

**115.07 Record Drawings.** Unless otherwise provided in the supplemental Specifications or Special Provisions, upon completion of the Work on Projects administered by the Water Engineering Manager of the City's Department of Water or administered by the Chief Engineer of the Department of Aviation, the Contractor shall organize the As-built Drawings into manageable sets, bind the sets with durable paper cover sheets, certify to the accuracy of the As-built Drawings by signature thereon, and deliver the As-built Drawings to the Engineer. The Engineer shall revise the original Contract drawing tracings or computer files with the information contained on the As-built Drawings provided by the Contractor and create the Record Drawings. The City may thereafter use the As-built Drawings for any purpose relating to the Project including, without limitation, additions to or completion of the Project.

**115.08 Guarantee.** The Contractor shall provide a Guarantee to the City that all Work is in conformity with the Contract Documents and free from defects in workmanship, Materials and Equipment for full period permitted under Ohio law. The Contract Bond shall remain in effect for the full Guaranty period, unless the Contractor shall provide a Maintenance Bond in form and substance and from a Surety satisfactory to the City. The Guarantee time period shall commence on the date of approval of the Certificate of Contract Completion by the Authorized Representative, unless otherwise provided in writing. The Guarantee time period for any incomplete or uncorrected Work at the time of Partial Occupancy or Use, if any, shall commence with the date of approval of the Certificate of Contract Completion by the Authorized Representative, unless otherwise provided in writing. The Guarantee provided in this 115.08 shall be in addition to, and not in limitation of, any other Guarantee, Warranty or remedy provided by law or by the Contract Documents.

**115.09 Warranty.** The Contractor shall, prior to installing material or Equipment which is subject to a Warranty, provide a copy of the Warranty to the Engineer for review and approval.

**115.10 Exercise of Guarantee or Warranty.** If defects in workmanship, material or Equipment become apparent within the applicable Guarantee or Warranty period, the Authorized Representative shall notify the Contractor in writing and provide a copy of the notice to the Engineer. Within ten Days of receipt of the notice, the Contractor shall visit the Project in the company of a representative of the City to determine the extent of all defects and shall promptly repair or replace the defects, including all adjacent property damaged as a result of such defects or as a result of remedying the defects. If the repair or replacement is considered by the Authorized Representative to be an emergency, the Authorized Representative may require the Contractor to visit the Project within one Day of receipt of the notice. The Contractor shall be fully responsible for the cost of and all expenses associated with temporary Materials or Equipment required during the repair or replacement of the defects, including without limitation labor, permits and other incidentals. If the Contractor does not promptly repair or replace the defects, the City may repair or replace the defects and charge the cost thereof plus any Consultant and attorney fees incurred by the City in enforcing its Guaranty or warranty rights to the Contractor or the Contractor's Surety. Work which is repaired or replaced by the Contractor shall be inspected and

accepted by a representative of the City and shall be Guaranteed by the Contractor for the remainder of the original Guarantee time period.

**115.11 Final Cleaning.** At the completion of the Work, the Contractor shall restore all property not designated for alteration by the Contract Documents to as near its original condition as practicable and clean the site of the Project and adjacent property of all dust, mud, waste Materials, and rubbish attributable to the Work and shall remove any temporary controls required pursuant to the storm water pollution prevention plan and permit.

**115.12 Final Cleaning Remedies.** Final cleaning shall be done to the satisfaction of the Engineer and the Authorized Representative. If the Contractor fails to clean up at completion of the Work, the provision of 105.02 may be invoked. If a dispute arises as to responsibility for final cleaning, the Engineer may employ City employees or engage a qualified cleaning company, to perform the clean up and deduct the cost from amounts due to the Contractor as the Engineer recommends and the Authorized Representative determines to be appropriate. The decision of the Authorized Representative on the responsibility for such cost shall be final, subject to 118.01 through 118.11.

**115.13 Work After Final Cleaning.** If any Work is performed after a final cleaning by the Contractor, the Contractor shall clean any affected area again as provided in 115.11 and 115.12 so that upon Contract Completion, the Project shall be left ready for occupancy or utilization by the City.

## ITEM 116 TIME

### 116.01 Time of Essence

### 116.02 Time Extensions

### 116.03 Critical Path

### 116.04 Extension Sole Remedy

### 116.05 Time for Contract Completion

### 116.06 Liquidated Damages

**116.01 Time of Essence.** Time is of the essence to the Contract Documents and all obligations thereunder. By executing the Contract Form, the Contractor acknowledges that the time for Contract Completion is, and by signing the Construction Schedule and Project Schedule, if applicable, that any specified milestone completion dates are, reasonable taking into consideration the usual weather and other conditions prevailing in the locality of the Project. The Contractor agrees that the Notice to Proceed shall establish the date for commencement of the Work. The Contractor agrees that the City has entered into, or may enter into, agreements or representations for use of all or part of the Project based upon the Contractor achieving Final Acceptance within the time for Contract Completion. The Contractor agrees that the Work will be prosecuted in a reasonable, efficient and economical sequence, in cooperation with the Engineer and in the order and time as provided in the current Construction Schedule and Project Schedule, if applicable. The Contractor shall perform the Work so as not to interfere with, disrupt, hinder, delay or impact the Work of other Persons on the Project and of such other Persons' Subcontractors and Material Suppliers. The Contractor agrees that the possibility that the Contractor may be subject to interference, disruption, hindrance, delay or impact in the progress of the Work from any and all causes is within the contemplation of the Contractor and the City and that the sole remedy for such interference, disruption, hindrance, delay or impact shall be an extension of time granted pursuant to 116.02, except where the Contractor establishes such interference, disruption, hindrance, delay, or impact was proximately caused by an improper action or failure to act by the Owner, in which case the Contractor may be entitled to additional compensation.

**116.02 Time Extensions.** If the Contractor is interfered with, disrupted, hindered, delayed or impacted at any time in the progress of the Work by any of the following causes, the time for Contract Completion shall be extended for such reasonable time which the Authorized Representative determines, in consultation with the Engineer, has been caused by the interference, disruption, hindrance, delay, or impact in the Work:

- (a) Due to suspension of the Work for which the Contractor is not responsible; unusually severe weather conditions not normally prevailing in the particular season; labor dispute, excluding informational pickets; fire; or flood; or
- (b) Due to any unforeseeable cause beyond the control and without fault or negligence of the Contractor;
- (c) The Contractor shall request any extension of time pursuant to 117.01 through 117.11.

**116.03 Critical Path.** Notwithstanding any other provision of the Contract Documents, time extensions will depend upon the extent to which the Work on the critical path of the Construction Schedule is affected, or if the Project involves multiple Contractors the extent to which Work on the critical path of the Project Schedule is affected. A Change Order granting a time extension may provide that the time for Contract Completion will be extended for only those specific elements so interfered with, disrupted, hindered or delayed and that remaining milestone completion dates will not be altered and may further provide for adjustment of Liquidated Damages.

**116.04 Extension Sole Remedy.** Any extension of time granted pursuant to 116.02 shall be the sole remedy which may be provided by the City, unless Contractor has established that a delay was proximately caused by an improper action or failure to act by the Owner, in which case Contractor may be entitled to additional compensation. . It is within the contemplation of the Contractor and the City that the Contractor may accelerate its performance to meet the Construction Schedule and that such acceleration is solely within the discretion of the Contractor.

**116.05 Time for Contract Completion.** The Contractor shall diligently prosecute the Work and shall complete all Work so that Final Acceptance occurs on or before the number of consecutive Days set forth in the Contract Documents following the date set forth in the Notice to Proceed, unless the Contractor timely requests and the City grants an extension of time in accordance with the Contract Documents. The period of time established by the preceding sentence is referred to herein as the time for Contract Completion. Each applicable portion of the Work shall be completed upon the respective milestone completion date unless the Contractor timely requests and the City grants an extension of time in accordance with the Contract Documents.

**116.06 Liquidated Damages.** Upon failure to complete all Work within the time for Contract Completion, the City shall be entitled to retain or recover from the Contractor, as Liquidated Damages, and not as a penalty, the applicable amount set forth in the following table for each and every Day thereafter until Contract Completion, unless the Contractor timely requests and the City grants an extension of time in accordance with the Contract Documents.

LIQUIDATED DAMAGES	Contract
Contract Amount	Completion
\$0 to \$50,000	\$150
more than \$50,000 to \$150,000	\$250
more than \$150,000 to \$500,000	\$500
more than \$500,000 to \$2,000,000	\$1,000
more than \$2,000,000 to \$5,000,000	\$2,000
more than \$5,000,000 to \$10,000,000	\$2,500
more than \$10,000,000	\$3,000

The amount of Liquidated Damages is agreed upon by and between the Contractor and the City because of the impracticability and extreme difficulty of ascertaining the actual amount of damage the City, its taxpayers and the public would sustain. Liquidated Damages only replace the City's actual damages for delays, are not the City's exclusive remedy for breach by the Contractor and are not to be construed in any way as a limitation of any other rights or remedies available to the City under the Contract Documents or otherwise. If a delay of the critical path in

completion of the Project occurs which is caused by the City and the Contractor concurrently, the applicable Liquidated Damages shall be apportioned, and the specific number of Days for which the City is solely responsible for shall be deducted from the total number of Days of the concurrent delay used in calculating the Liquidated Damages and the Contractor shall pay Liquidated Damages for the remaining number of Days of delay. In addition to the amounts specified above, the City may charge the Contractor for all inspection regardless of any time extension.

## ITEM 117 - CHANGES IN THE WORK

- 117.01 Change Order
- 117.02 Payment of Change Order
- 117.03 Requirement to Perform Changed Work
- 117.04 Change Order Price Determination
- 117.05 Change Order Procedures
- 117.06 Change Order Process
- 117.07 Paperwork Consolidation
- 117.08 Change Order Numbering System
- 117.09 Project Contingency Funds
- 117.10 Change Order Pricing Guidelines
- 117.11 Differing Site Conditions
- 117.12 Time Extension

**117.01 Change Order.** The City Commission or the Authorized Representative, without invalidating the Contract, may order changes in the Work consisting of additions, deletions or other revisions, including without limitation revisions resulting from an extension granted in accordance with 116.04. To the extent the time for Contract Completion or the Contract price is affected, the Contract may be adjusted by Change Order in accordance with 117.01 through 117.12. The Contractor shall proportionately increase the amount of the Contract Bond whenever the Contract price is increased. If notice of any change affecting the Contract is required by the provision of any Contract Bond, the giving of any such notice shall be the Contractor's responsibility, and the amount of each applicable Contract Bond shall be adjusted accordingly.

**117.02 Payment of Change Order.** The Contractor shall not proceed with any change in the Work without the required written Change Order. If the Contractor believes that any item is not Work required by the Contract Documents or reasonably inferred therefrom to produce the intended results, the Contractor shall obtain a Change Order before proceeding with such item. Except as provided in 118.01 through 118.11, failure to obtain such a Change Order shall constitute a waiver by the Contractor of any claim for additional compensation for such item. The Contractor understands and agrees that agreement to a Change Order is final and without reservation of any rights.

**117.03 Requirement to Perform Changed Work.** If the Contractor does not agree to, or fails or refuses to sign, a Change Order, the Contractor shall perform any Work related to the Change Order as required by the Authorized Representative in accordance with 117.04; provided, however, the Contractor may seek compensation and time extension in accordance with 117.04 and 117.10 through 117.12, as applicable, and 118.01 through 118.11 for any such Work performed. The City reserves the right to cancel or modify any Change Order authorization.

**117.04 Change Order Price Determination.** The maximum cost or credit resulting from a change in the Work shall be determined as provided in 117.04 through 117.10. Proposals which do not set forth all information required by 117.05 and 117.10 will not be considered or accepted under any circumstances. A Unit Price Proposal shall only be valid when incorporated into the Contract by Change Order; provided, however, that Unit Price Work set forth on the Bid, included

in the Contract price and which does not exceed the scheduled quantities on the Bid may be performed and paid for without a Change Order. The amounts allowed for overhead and profit are all-inclusive, include all Contractor Project costs relating to field and home office operations, and no additional or other amounts for overhead or profit shall be allowed. The maximum cost or credit as determined by 117.10 includes all compensation for direct, indirect, and cumulative impact costs and no additional or other amounts for impact costs shall be allowed. The Contractor shall not assign any portion of the Work to another whereby the Contractor would benefit directly or indirectly from the double application of charges for overhead or profit. If no agreement can be reached between the Contractor and the City as to the cost or credit resulting from a change in the Work or the Contractor fails or refuses to sign a Change Order, the cost or credit shall be determined by the Authorized Representative, upon the recommendation of the Engineer. The Contractor shall proceed with the Change Order Work when so required by the Authorized Representative in writing. The Contractor may dispute the Authorized Representative's determination of the cost or credit by filing a claim in accordance with 118.01 through 118.11. The City reserves the right to require certified payrolls for labor costs and certified invoices for material costs, together with any other documentation the City deems in its sole discretion to be useful in analyzing the Contractor's claim and reserves the right to audit the records of the Contractor and the Contractor's Subcontractors and Material Suppliers. Failure by the Contractor to provide all requested documentation within 10 days shall constitute an irrevocable waive of Contractor's claim.

**117.05 Change Order Procedures.** The Contractor must be certain to comply with the applicable procedures or payment may be delayed or denied. The Engineer has responsibility for:

- (a) Preparing, reviewing, recommending, coordinating, monitoring and processing a Change Order and related documents;
- (b) Reviewing the Contractor's pricing within the stated time period, verifying the pricing complies with the pricing guidelines set forth in 117.10 and negotiating pricing, if necessary, to an amount acceptable to the City;
- (c) If the change is to have a not-to-exceed price based on performing the Work on a time and material basis or other cost-plus basis, monitoring the Contractor's progress toward completing the revised portion of the Work and requiring that the Contractor prepare daily records of additional labor, Materials and Equipment required along with a certification from the Contractor that the records are accurate and appropriate for the revised Work. The Engineer shall review these daily records and sign them, but solely for the purposes of signifying that the records are an accurate accounting of the items described therein, and provide a signed copy of the daily records to the Authorized Representative. The signed daily records are also to be attached to the Change Order. If the changed Work should cost less than the maximum amount noted on the Change Order, the Engineer is also responsible for preparing a deduct Change Order for the cost difference;
- (d) Reviewing and resolving the Contractor's request for an extension of time related to a Change Order in accordance with 116.01 through 116.06 and 117.12;
- (e) Confirming that the City concurs with the change and has available funds or a written commitment for funding the Change Order;

(f) Monitoring the overall Change Order process for timeliness and follow up.

The Contractor has responsibility for:

(a) Responding to requests for pricing within the stated time period;

(b) Preparing all necessary Proposals in sufficient detail for intelligent review with pricing and schedule impact, including those of all affected Subcontractors and Material Suppliers according to the pricing guidelines set forth in 117.10 or Unit Prices, as applicable, and negotiating pricing, if necessary;

(c) If the change is proposed to have a not-to-exceed price based on performing the Work on a time and material basis or other cost plus basis, furnishing and certifying detailed records of all labor, Materials and Equipment provided. If the changed Work should cost less than the maximum amount noted on the Change Order, the Contractor is also responsible for executing a deduct Change Order prepared for the cost difference;

(d) Proceeding with the Work upon receipt of a fully signed Change Order;

(e) If the Contractor performs Work without the appropriate, required Change Order, the Contractor does so at the Contractor's own risk that payment for such Work may not be approved or made, unless the City has required the Contractor to perform the Work in accordance with 117.03 and 117.04;

(f) Providing the changed Work in a timely manner and as authorized by the Change Order, all in accordance with the requirements of the Contract Documents; and

(g) Timely providing to Engineer and the Authorized Representative all requested backup documentation.

**117.06 Change Order Process.** When a change to the Work is ordered, the Engineer shall:

(a) Prepare an estimate of the cost of the changed Work and verify with the Authorized Representative that the change is ordered and that funds are available in the amount of the estimate for the Work;

(b) Prepare a detailed scope of Work in Bulletin form, including any necessary Drawings;

(c) Submit the Bulletin to the Authorized Representative for approval, along with a justification letter indicating the reason for the change in the Work;

(d) Upon receipt of approval by the Authorized Representative, release the Bulletin to the Contractor with a date specified for the Contractor to return a Proposal. If the Contractor fails to respond to the Engineer within the time specified, or as otherwise agreed to in writing by the Contractor and the Engineer, the Contractor shall be responsible for any additional costs incurred by the Contractor, the Engineer and the City resulting from any attendant delay;

(e) Review the Contractor's Proposal, verifying that pricing complies with the pricing guidelines set forth in 117.10 or Unit Prices, as applicable, and negotiate the price if required to obtain a price less than the maximum established by the pricing guidelines or different from the amount calculated using Unit Prices where appropriate. Within seven Days of receipt of the Contractor's Proposal, the Engineer shall notify the Contractor whether the Proposal is acceptable in form or advise the Contractor in writing of the reasons for disapproval. If negotiation of the price is necessary, any failure of the Contractor to respond appropriately and within the time specified, or as otherwise agreed to in writing by the Contractor and the Engineer shall cause the Contractor to be responsible for any additional costs incurred by the Contractor, the Engineer and the City resulting from any attendant delay;

(f) Determine the basis for pricing the Work and confirm whether the Work is for a fixed price, or for a not-to-exceed price based on performing the Work on a time and material basis, or other cost-plus basis. Verify that any Subcontractor and Material Supplier pricing is included and complies with the pricing guidelines set forth in 117.10 or Unit Prices, as applicable. Review any requested time extension with the Authorized Representative to be determined according to 116.01 through 116.06 and 117.12 and obtain written recommendation of approval of the Change Order from the Engineer and the applicable Director if other than the Engineer. Sign and obtain the Contractor's signature on the Change Order;

(g) Submit the Proposal to the Authorized Representative or the City Commission, as applicable, for approval along with the written recommendation of approval or disapproval of the Proposal of the City Engineer and other City Department head, if applicable;

(h) Deliver multiple copies of the signed Change Order package to the Authorized Representative for signing and any necessary fund certification. Upon signing by the Authorized Representative, the Authorized Representative shall return copies of the executed Change Order to the Contractor and the Engineer. The Contractor may bill for Work covered by the Change Order only after this final step.

**117.07 Paperwork Consolidation.** Related transactions occurring at or about the same time shall, whenever possible, be consolidated into the same Bulletin or Change Order, or both. Add and deduct items may be included on the same Change Order, as well as items with different reasons for changed Work so long as the reason and pricing for each item is separately stated.

**117.08 Change Order Numbering System.** Unless otherwise provided in the Contract Documents, the Engineer shall assign a number to each change which shall be stated on the Bulletin, starting with number 001. All Contractors affected by the change will be recorded under the same number. The Engineer will establish and maintain a Change Order log to track all activities related to Change Order processing and taking care not to duplicate or reuse any Change Order number throughout the Project.

**117.09 Project Contingency Funds.** Project Contingency Funds shall be reserved to pay costs resulting from Change Orders, unanticipated job conditions, to comply with rulings regarding building and other codes, to pay costs related to errors and omissions in Contract Documents, and to pay the cost of settlements and judgments related to the Project. Change

Orders for which there are sufficient moneys in the Contract price including the Project Contingency Funds must be approved by the Engineer and the Authorized Representative. Change Orders which would increase the Contract price must be approved by the City Commission.

**117.10 Change Order Pricing Guidelines.** For each change, the Contractor shall furnish a detailed, written Proposal itemized according to these pricing guidelines. Any Subcontractor or Material Supplier pricing shall also be itemized according to these pricing guidelines. Where Unit Prices were included in the Bid and the Contract price, the Engineer may also require incorporation of such Unit Prices or preparation of an Alternate Proposal incorporating such Unit Prices. These pricing guidelines are intended to establish the maximum amount which the City will pay for any Change Order, including without limitation all amounts for interference with, delay, hindrance, disruption or impact of the Work. A Change Order may provide that the City may pay less than the amount established by these pricing guidelines if such amount is negotiated by the Engineer in accordance with 117.06 or is determined in accordance with 118.01 through 118.11. As provided in 114.01 the Contract Cost Breakdown may be used by the City to determine any cost or credit. In order to expedite the review and approval process, all Proposals shall be prepared in the categories and in the order listed below. This provision is intended to be, and shall be construed as, consistent with, and not in conflict with, Section 4113.62, ORC to the fullest extent permitted. The pricing guidelines are:

- (a) **LABOR** - All field labor shall be priced at the current base rate, excluding fringe benefits, of the prevailing wage in the Project locality. The Proposal and documentation is to include number of hours and rate of pay for each classification of worker. If the Contractor pays an employee a base rate exceeding prevailing wage, the Contractor shall submit certified payroll records that substantiate that rate. Any Contractor performing Work on a time and material basis or the cost-plus basis Work shall submit certified payroll records for all employees performing that Work;
- (b) **FRINGES** - All established payroll taxes, assessments and fringe benefits on the labor. This may include, without limitation, FICA, Federal and State Unemployment, Health and Welfare, pension Funds, Workers' Compensation and Apprentice Fund. Each of the fringes is to be a separate line item. The Contractor shall submit documentation supporting the calculation of the amounts for each fringe for each worker classification;
- (c) **EQUIPMENT RENTALS** - All charges for certain non-owned heavy or specialized Equipment at up to one hundred percent of the documented rental cost. No rental charges will be allowed for hand tools, minor Equipment, simple scaffolds, etc. Downtime due to repairs, maintenance and weather delays will not be allowed. The Contractor shall submit copies of actual paid invoices to substantiate rental costs;
- (d) **OWNED EQUIPMENT** - All charges for certain owned, heavy or specialized Equipment at up to one hundred percent of the cost listed by the Associated Equipment Dealers Green book rental rates and Specifications for construction Equipment. No recovery will 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 will be the basis for the pricing. Downtime due to repairs, maintenance and weather delays will not be allowed;

(e) TRUCKING - A reasonable delivery charge or per-mile trucking charge for delivery of required Materials or Equipment. Charges for use of a pick-up truck will not be allowed;

(f) OVERHEAD - Overhead on items in 117.10 (a)-(d) up to ten percent, which shall include all costs required to schedule and coordinate the Work. Overhead includes, without limitation, telephone, telephone charges, facsimile, electronic mail, telegrams, postage, photos, photocopying, hand tools, simple scaffolds (1 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 other home office expense, legal services, travel and parking expenses; provided, however, shop or engineering labor, which shall not be subject to prevailing wage rates, for steel Fabricators, sheet metal Fabricators and sprinkler system Fabricators will be allowed under 117.10 (a)-(d);

(g) MATERIALS - All Materials purchased by the Contractor and incorporated into the changed Work, showing costs, quantities, or Unit Prices of all items, as appropriate. Reimbursement of material costs shall only be allowed in the amount of the Contractor's actual cost, including any and all discounts, rebates or related credits. One-third of the cost of reusable Materials for each use, such as formwork lumber, shoring or temporary enclosures;

(h) PROFIT - Profit on items in 117.10 (a)-(g) up to ten percent;

(i) SUBCONTRACTOR - The reasonable cost of all labor and material provided by a Subcontractor whose pricing is included and which complies with these pricing guidelines;

(j) CONTRACTOR MARK-UP ON SUBCONTRACTOR - Mark-up on items in 117.10 (i) up to five percent or 2,500 dollars, whichever is less;

(k) MISCELLANEOUS - The following items are allowable as the cost of the Work, with no overhead or profit:

.1 Any additional bond or insurance premium specifically incurred as a result of the Change Order;

.2 Fees for permits, licenses, inspections, test, etc.; and

(l) Costs which will not be reimbursed for Change Order Work include the following:

.1 Overnight lodging, travel and food;

.2 Employee Profit Sharing Plans - regardless of how defined or described, the Contractor will pay these charges from Contractor profit and will not be reimbursed; and

.3 Voluntary Employee Deductions - examples are United Way and U.S. Savings Bonds.

(m) State sales tax shall be allowed on items as described in 104.18.

**117.11 Differing Site Conditions.** Subject to 103.06, during the progress of the Work, if subsurface or concealed conditions are encountered at the site differing materially from those indicated in the Contract Documents or if subsurface or concealed physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work provided for in the Contract Documents, are encountered at the site, the Contractor shall promptly notify the Engineer in writing of the specific differing conditions before they are disturbed or the affected Work is performed and if such notice is not possible, in no event later than 2 Business Days after Contractor first observed the conditions. Upon notification, the Engineer will investigate the conditions and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any Work under the Contract, a Change Order may be issued in accordance with the 117.01 through 117.12, as applicable. The City may decline to issue a Change Order if the notice required by this 117.11 is not timely provided by the Contractor. If the Contractor fails to timely provide the notice required by this 117.11, the Contractor shall be deemed to have waived any and all claims for additional compensation or time extensions for the related subsurface or concealed physical condition.

**117.12 Time Extension.** Notwithstanding any other provision of the Contract Documents, time extensions for changes in the Work will depend upon the extent to which the change causes delay in Work on the critical path of the Construction Schedule or if the Project involves multiple Contractors of the Project Schedule as determined pursuant to 109.06 and 109.05, respectively. If extending the time for Contract Completion is not possible, the Contractor shall price, and separately state, all costs of accelerated performance in the Contractor's Proposal. A Change Order granting a time extension may provide that the time for Contract Completion will be extended for only those specific elements actually delayed and that remaining milestone completion dates will not be altered and may further provide for adjustment of Liquidated Damages, to the fullest extent permitted by law. The Contractor shall not be entitled to any time extensions for delays caused by Contractor, its subcontractors, suppliers, normal weather conditions for the time of year and locality, or abnormal weather conditions that do not affect the critical path.

## ITEM 118 DISPUTE RESOLUTION PROCEDURE

### 118.01 Notice and Claim Requirements

### 118.02 Filing of Notice

### 118.03 Filing of Claim

### 118.04 Claim Response

### 118.05 Claim Review and Decision

### 118.06 Appeal to Board of Review

### 118.07 Alternate Dispute Resolution

### 118.08 Delegation

### 118.09 Auditing of Claims

### 118.10 False Certification of Claims

### 118.11 Performance and Payment

**118.01 Notice and Claim Requirements.** Whenever the Contractor intends to seek additional time or compensation or mitigation of Liquidated Damages, whether due to delay, extra Work, additional time or Work, breach of Contract, or other causes arising out of or related to the Contract or the Project, the Contractor shall follow the procedures set forth in 118.01 through 118.11. The Contractor acknowledges and agrees that the Owner may delay, interfere with, and/or disrupt the Work of the Contractor, and such actions do not constitute a material breach of contract by the Owner, since the Contractor is entitled to additional compensation by properly submitting and pursuing a Claim as permitted by these Specifications. To the fullest extent permitted by law, failure by the Contractor to follow the procedures in 118.01 through 118.11 is a waiver of any claim for additional time or compensation or for mitigation of Liquidated Damages. Compliance with all applicable procedures in 118.01 through 118.11 is a condition precedent to the filing by the Contractor of any litigation related to the Contract or the Project.

**118.02 Filing of Notice.** Unless a shorter notice period is provided elsewhere in this Agreement, the Contractor shall file notice of any claim with the Engineer, in writing, no more than ten Days after the initial occurrence of the events, which are the basis of the claim. To the fullest extent permitted by law, failure of the Contractor to timely and completely provide such notice shall constitute a waiver by the Contractor of any claim for additional time or compensation or for mitigation of Liquidated Damages. Every such written notice shall provide the following information to permit timely and appropriate evaluation of the claim, determination of responsibility and opportunity for mitigation:

- (a) Nature of claim and estimated amount of the claim, including all costs for interference, disruption, hindrance, delay and any impact, which amount shall be calculated in accordance with the pricing guidelines set forth in 117.10, shall be based upon the Contractor's experience and shall be a fair and reasonably accurate assessment of the damages suffered or anticipated by the Contractor, as applicable;
- (b) Specific number of Days of extension requested and specific number of Days for remobilization requested;
- (c) Identification of Persons and events responsible for causing the claim, including without limitation the date or anticipated date, as applicable of the commencement of any interference, disruption, hindrance, delay or impact;

- (d) Identification of activities on the Construction Schedule and the Project Schedule, if applicable, which will or may be affected by the claim or new activities which will or may be created and the relationship with existing activities;
- (e) Anticipated impacts and anticipated duration of any interference, disruption, hindrance, delay or impact and any remobilization period; and
- (f) Recommended action to avoid or minimize any interference, disruption, hindrance, delay or impact.

**118.03 Filing of Claim.** With respect to every claim submitted, the Contractor shall file three copies of its claim with the Engineer not more than thirty Days after the notice required by 118.02 and, in all events prior to Contract Completion. The Contractor's claim shall detail the amounts claimed and provide the following information to permit timely and appropriate evaluation of the claim, determination of responsibility and any remaining opportunity for mitigation. If the Contractor is unable to calculate any amount claimed in detail, the Contractor shall use its best efforts to provide a reasonable estimate of such amount:

- (a) A narrative of the event, or combination of events, claimed as resulting in interference, disruption, hindrance, delay or impact to the Contractor, including the start date of the event or events and the actual, or anticipated, finish date;
- (b) A quantification of the planned Work items and the changed scope of Work items claimed as having been impacted;
- (c) A time impact analysis, consistent with standard critical path methodology for scheduling, demonstrating the impact to the Contractor's scheduled activities;
- (d) Copies of the Contractor's daily log for each Day of impact;
- (e) Copies of relevant correspondence and other information regarding or supporting Contractor entitlement;
- (f) Copies of Contractor payroll records for labor impacts claimed by Contractor and any Subcontractor affected by the event or events;
- (g) Copies of invoices for material impacts claimed by the Contractor and any Subcontractor affected by the event or events;
- (h) Copies of Equipment records, or rental invoices, for any Equipment impacts claimed by the Contractor or any Subcontractor affected by the event or events;
- (i) Copies of the most recent Contractor's income statement, 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;
- (j) A copy of Contractor's original coded bid takeoff and estimating records that formed the basis of Contractor's bid;

(k) Contractor's coded Job Cost Report with a key to the coding;

(l) A statement, signed by an authorized representative of the Contractor, certifying that the claims are made in good faith, the supporting data is accurate and complete to the best of the Contractor's knowledge and belief and the amount requested accurately reflects the Contract adjustment for which the Contractor believes the City is liable in accordance with the Contract Documents, in particular the pricing guidelines set forth 117.10.

The City may request documents and information from the Contractor in addition to those listed in this 118.03, as the City determines necessary to evaluate and comment upon the Claim. Upon receipt of such request from the Owner, the Contractor shall provide all requested documents and information within ten (10) days. The Contractor shall provide the requested documents in the formats requested, which include both paper and electronic copies. If requested by the City, the electronic copies shall be provided in native computer language. The Contractor's provision of the requested documents to the City in the format requested by the City shall be a condition precedent to any further proceeding under the Contract Documents. Failure to provide the requested documents shall be a material breach of the Contract, and the Contractor shall indemnify the City for all of the City's costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the Contractor's failure to comply with this provision. If the Contractor fails to provide the requested documents, the Contractor shall be deemed to have irrevocably waived its claim.

**118.04 Claim Response.** Immediately upon receipt of any claim submitted by the Contractor in accordance with 118.03, the Engineer shall deliver 2 copies to the Authorized Representative. Upon submission of the claim by the Contractor, the Engineer shall convene a meeting with the Contractor and any applicable Subcontractors and Material Suppliers to review and discuss the claim. The Engineer shall review the Contractor's claims with all attendees and discuss any questions regarding the nature or content of the required items. Any items deemed deficient shall be corrected by the Contractor before the Engineer will commence review in accordance with 118.05. The Engineer shall document the timeliness of notice provided under paragraph 118.02 and the actual date of corrected submission of the claim.

**118.05 Claim Review and Decision.** Upon corrected submission of the claim and all requested documentation by the Contractor, the Engineer shall review the claim and prepare a written analysis of its content. The analysis may include a narrative of the examination of the facts giving rise to the claim, relevant Contract Documents and language therein, an analysis of claimed additional labor, Materials and Equipment for the scope of the Work items described and an analysis of any time extension for any interference, disruption, hindrance, impact or delay claimed (including the calculation of any concurrent delays affecting entitlement) and shall include confirmation of the calculation of claimed labor, Materials and Equipment as conforming to the pricing guidelines set forth in 117.10 and a concluding recommendation regarding Contractor entitlement to, and the appropriateness and reasonableness of, all or any part of, the claimed costs and time extension. The Engineer may include copies of contemporaneous documentation supporting any recommendation regarding the sufficiency or inadequacy of the Contractor's claim, the Contractor's performance or the rebuttal of the claim. The Engineer shall prepare and submit the claim analysis to the Authorized Representative within thirty Days of the corrected

submission of the claim. The Authorized Representative shall examine the Contractor's claim, and the analysis of the claim submitted by the Engineer. The Authorized Representative shall approve or deny all or any part of, the Contractor's claim and forward a written decision to the Contractor and the Engineer within thirty Days after receipt of the Engineer's claim analysis. The decision of the Authorized Representative shall be final and conclusive, unless the Contractor appeals the decision to the Board of Review in accordance with 118.06. In the event either the Engineer or the Authorized Representative fail to act in accordance with the foregoing schedule, the claim shall be deemed denied.

**118.06 Appeal to Board of Review.** The Contractor may appeal the decision of the Authorized Representative to the Board of Review by written notice to the Authorized Representative within ten Days of receipt of the Authorized Representative's decision or, in the absence of a decision, within 10 days of the expiration of the time set forth in 118.05. Failure by the Contractor to provide notice of an appeal within the said 10-day period shall result in the Engineer's decision becoming final and binding upon the Contractor. The Board of Review shall meet within thirty Days of receipt of the notice by the Authorized Representative. The Contractor shall be given an opportunity to present the claim at the meeting. The purpose of the meeting shall be to settle the issues in dispute. The Board of Review shall render a decision on the claim within thirty Days of the meeting unless a mutual agreement is made between the Contractor and the Board of Review to extend the time for decision. The decision of the Board of Review shall be final and conclusive, unless the Contractor provides written notice to the Authorized Representative of the Contractor's intention to file litigation within ten Days of receipt of the decision. The filing of an appeal and the provision of notice of intention to file litigation are each a condition precedent to the filing of any litigation related to the Project or the Contract by the Contractor and any failure by the Contractor to timely fulfill them will preclude the Contractor from filing any such litigation.

**118.07 Alternate Dispute Resolution.** If, upon consideration of a claim, the Contractor and the City mutually agree in writing, the dispute resolution procedure may be waived, or the claim may be referred to a form of Alternative Dispute Resolution, including a procedure to equitably share the costs of the Alternative Dispute Resolution.

**118.08 Delegation.** No provision shall prevent the Board of Review or the Authorized Representative from delegating the duties or authorities of the Board of Review or the Authorized Representative to any third Person selected at the discretion of the Board of Review or Authorized Representative, as applicable.

**118.09 Auditing of Claims.** All claims by the Contractor shall be subject to audit at any time following the filing of such claim, whether or not such claim is part of litigation pending in the courts of this State. The audit may be performed by employees of the City or by a consultant engaged by the City. The audit may begin on ten Days' notice to the Contractor, Subcontractor or Material Supplier, as applicable. The Contractor, Subcontractor or Material Supplier shall use its best efforts to cooperate with the audit. Failure of the Contractor, Subcontractor or Material Supplier to maintain and retain sufficient records to allow the City to verify the claim shall constitute a waiver of any portion of such claim that cannot be verified. Without limiting the foregoing, and as a minimum, the Contractor, Subcontractor or Material Supplier shall make available to the City the following documents:

- (a) Daily time sheets and foreperson's daily reports;
- (b) Union agreements, if any and employer agreements;
- (c) Insurance, welfare, fringes and benefits records;
- (d) Payroll register;
- (e) Earnings records;
- (f) Payroll tax returns;
- (g) Material invoices, purchase orders, Subcontractor Contracts and all material and supply acquisition Contracts;
- (h) Material cost distribution worksheets;
- (i) Equipment records (list of Contractor Equipment, rates, etc.);
- (j) Vendor rental agreements, and Subcontractor invoices;
- (k) Subcontractor payment certificates;
- (l) Canceled checks (payroll and vendors);
- (m) Job cost reports;
- (n) Job payroll ledger;
- (o) General ledger, general journal, (if used) and all subsidiary ledgers and journals together with all supporting documentation pertinent to entries made in these ledgers and journals;
- (p) Cash disbursements journal;
- (q) Financial statements for all years reflecting operations on the Project;
- (r) Income tax returns for all years reflecting operations on the Project;
- (s) Depreciation records on all Equipment utilized whether such records are maintained by the Contractor involved, its accountant, or others;
- (t) 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 such other source documents;
- (u) All documents which reflect the Contractor's actual profit and overhead, or the calculation of overhead multipliers, during the years the Project was being performed and for each of the five years prior to the commencement of this Project;

(v) All documents related to the preparation of the Contractor's Bid, including the contemporaneous final calculations on which the Bid was based;

(w) All documents which relate to each and every claim together with all documents which support or negate the amount of damages as to each claim;

(x) 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 which establish the time periods, individuals involved, the hours and rate of pay for the individuals; and

(y) All other documents required by the City in its discretion to intelligently review the claim.

**118.10 False Certification of Claims.** The Contractor shall not knowingly present or cause to be presented to the Owner a false or fraudulent Claim. "Knowingly" shall have the same meaning as in Section 3729(b) USC of the Federal False Claims Act. If the Contractor knowingly presents or causes to be presented a false or fraudulent Claim, then the Contractor shall be liable to the Owner for the same civil penalty and damages as the United States Government would be entitled to recover under such Section 3729(a) USC and shall also indemnify and hold the City harmless from all costs and expenses, including the City's attorneys' and consultants' fees and expenses incurred in investigating and defending against such Claim and in pursuing the collection of such penalty, damages, and fees and expenses. If any Contractor falsely certifies all or any part of a claim, the portion of the claim so certified shall be denied. If any Contractor is found to have falsely certified all or any part of any claim, that fact may be used to support a finding of ineligibility in future Bids for the award of any City Contract.

**118.11 Performance and Payment.** The Contractor shall proceed with performance of the Work during any dispute resolution process, unless otherwise agreed by the Contractor and the Authorized Representative in writing. The City 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 the Authorized Representative in writing. If the Contractor accepts the decision of the Authorized Representative or the City Commission and foregoes litigation of the claim, any payment to be made, credit to be provided or extension of time to be granted pursuant to the decision shall be evidenced by a Change Order package consisting of a completed Change Order form signed by the Contractor, the Engineer and the Authorized Representative, a copy of the approval of the City Commission and any necessary supporting documentation and any payment shall be made pursuant to a Payment Request in accordance with 114.02 and 114.03 or 114.10 through 114.13, as applicable.

**118.12 Settlement Offers.** If the Contractor initiates a Claim, the City may make settlement offers to settle the Claim at any time up to the date of the trial. Such settlement offers shall be subject to Rule 408 (Compromise and Offers of Compromise) of the Ohio Rules of Evidence. If at any stage of the litigation, including any appeals, the Contractor's Claim is dismissed or found to be without merit, or if the damages awarded to the Contractor on its Claim do not exceed the City's last settlement offer, the Contractor shall be liable to the City and shall reimburse the City for all of the City's attorneys' fees and expenses, and arising out of or related to such Claim since the date of such last settlement offer.

## ITEM 119 CONTRACT TERMINATION

### **119.01 Notice to Surety**

### **119.02 Suspension of Work**

### **119.03 Termination for Convenience**

### **119.04 Termination for Cause**

### **119.05 Contractor Bankruptcy**

**119.01 Notice to Surety.** The Authorized Representative shall provide notice to the Contractor's Surety of any Suspension or Termination pursuant to 119.01 through 119.05; provided, however, the failure to provide such notice shall not release the Surety from any of its obligations.

**119.02 Suspension of Work.** If, in the judgment of the Authorized Representative, the Contractor is causing undue risk of damage to any part of the Project or adjacent area, the Authorized Representative may suspend the Work temporarily, either wholly or in part, for such period until, in the judgment of the Authorized Representative, the safe and proper prosecution of the Work may be resumed. The Authorized Representative may also suspend the Work either in whole or in part for a specified number of Days on account of public necessity, adverse weather conditions, or other similar reasons which are beyond the control of the Contractor. In case of such a suspension, an extension of time, if appropriate, may be allowed as provided in the Contract Documents but no payment will be made to the Contractor for any expense or damages resulting therefrom, except where Contractor has established that a delay was proximately caused by an improper action or failure to act by the Owner, in which case Contractor may be entitled to additional compensation. Any failure of the Authorized Representative to suspend the Work shall not relieve the Contractor of the Contractor's responsibility to perform the Work safely and in accordance with the Contract Documents. The Contractor shall, upon receipt of notice of suspension, cease Work on the suspended activities and take all necessary or appropriate steps to limit disbursements and minimize costs with respect thereto. The Contractor shall furnish a report to the Authorized Representative, within five Days of receipt of the notice of suspension, describing the status of the Work, including without limitation, results accomplished, conclusions resulting therefrom, and such other information as the Authorized Representative may require. In the event of suspension, the Contractor shall be entitled to payment of compensation due under the Contract Documents, upon submission of a proper invoice, for the Work performed prior to receipt of notice of suspension, which shall be payable based upon the Contract Cost Breakdown.

**119.03 Termination for Convenience.** The City may, at any time upon seven Days written notice to the Contractor, terminate the Contract in whole or in part for the City's convenience and without cause. Upon receipt of the notice of termination for convenience, the Contractor shall immediately, in accordance with instructions from the Authorized Representative, proceed with performance of the following duties:

- (a) Cease operation as specified in the notice;
- (b) Place no further orders and enter into no further subcontracts for Materials, labor, services or facilities except as necessary to complete continued portions of the Project;

- (c) Terminate all subcontracts and orders to the extent they relate to the Work terminated;
- (d) Proceed to complete the performance of any Work not terminated; and
- (e) Take actions that may be necessary, or that the Authorized Representative may require, for the protection and preservation of the terminated Work.

Upon termination for convenience, the Contractor shall be paid in accordance with the Contract Cost Breakdown for Work completed, including any amount retained, and the value of Materials ordered and delivered, less any salvage credit the Contractor may receive for them. All Materials, Equipment, facilities and supplies at the Project site, or stored off site, for which the Contractor has been compensated, shall become property of the City. The Contractor may submit evidence of any reasonable expenses directly attributable to the termination of the Work for consideration by the City. The Contractor shall not be entitled to any profit or overhead for Work not performed and in no event shall the Contractor's compensation exceed the total Contract price. Any dispute as to the sum then payable to the Contractor shall be resolved in accordance with the provisions of 118.01 through 118.11.

**119.04 Termination for Cause.** If the City determines that the Contractor has failed to prosecute the Work with the necessary force or in a timely manner; failed to make payments to Subcontractors or Suppliers pursuant to the agreements between the Contractor and Subcontractors or Suppliers; disregards any applicable laws, statutes, ordinances, codes, rules, regulations, or lawful orders of a public authority; has refused to remedy any Defective Work; or is otherwise in substantial breach of the Contract Documents, the Authorized Representative shall notify the Contractor and the Contractor's Surety of such failure or refusal. The Contractor shall begin to cure such failure or refusal within two Business Days of receipt of the notice. If the Contractor fails to continuously and diligently pursue and cure such failure or refusal within twenty Days of receipt of the notice, the City may, without prejudice to any of its other rights or remedies, terminate the Contract and employ upon the Work the additional force, or supply the Materials or such part of either as is appropriate, and may remove Defective Work. If the Contractor is so terminated, the Contractor's Surety may be given the option to engage another Contractor to perform the Contract, with the approval of the Authorized Representative. If the Contractor's Surety does not commence performance of the Contract within ten Days of the date on which the Contract was terminated, the City may complete the Work by such means as the Authorized Representative deems appropriate. The City may take possession of and use all Materials, facilities, and Equipment at the Project site or stored off site for which the City has paid. If the Contract is so terminated, the Contractor shall not be entitled to any further payment. If the City completes the Work and if the cost of completing the Work exceeds the balance of the Contract price, including compensation for all direct and consequential damages incurred by the Engineer and/or the City as a result of the termination, such excess shall be paid by the Contractor or the Contractor's Surety. If the Contractor's Surety performs the Work, the provisions of the Contract Documents shall govern the Surety's performance, with the Surety being substituted for the Contractor in all such provisions including, without limitation, provisions for payment for the Work and provisions about the right of the City to complete the Work. Upon a final determination, by a court of competent jurisdiction, that the termination pursuant to 119.04 was improper, the termination shall be deemed a termination for convenience pursuant to 119.03.

**119.05 Contractor Bankruptcy.** If the Contractor files a voluntary petition in bankruptcy or has an involuntary petition in bankruptcy filed against the Contractor, or if the Contractor makes

a general assignment for the benefit of creditors, or if a receiver is appointed for all or a substantial part of the Contractor's business or property, the Authorized Representative shall serve written notice on the Contractor and the Contractor's Surety stating that any failure of the Contractor to provide adequate assurances of continued performance will be considered a rejection of the Contract, which shall result in termination of the Contract for cause. In such event, Surety shall be immediately responsible for timely and property completion of the Work. Such termination of the Contract need not be evidenced by an order of any court rejecting the Contract. Upon a final determination, by a court having jurisdiction, that the termination was improper, the termination will be deemed to be a termination for convenience pursuant to 119.03.

## ITEM 120 - AUDITS AND RECORDS

### 120.01 Examination

### 120.02 Termination and Disputes

### 120.03 Non-Disclosure by Contractor

### 120.04 Interest

**120.01 Examination.** The City shall have the right to examine all books, records, documents and other data of the Contractor and of the Contractor's Subcontractors and Material Suppliers related to the Bidding, pricing, or performance of the Work, including without limitation for the purpose of evaluating any Proposal or claim. Such Materials shall be made available at the office of the Contractor, Subcontractor, or Material Supplier, as applicable, at all reasonable times for inspection, audit and reproduction until the expiration of seven years after the date of Final Acceptance of the Project by the City. To the extent that the Contractor, Subcontractor, or Material Supplier, as applicable, informs the City in writing that any documents copied by the City are trade secrets, the City shall treat such documents as trade secrets of the Contractor, Subcontractor, or Material Supplier, as applicable. In the event, any dispute arises with any other Person about whether such other Person should be given access to the documents, the Contractor, Subcontractor, or Material Supplier, as applicable, agrees to indemnify the City against all costs, expenses and damages, including without limitation attorneys' fees, incurred or paid by reason of such dispute. The right of inspection, audit, and reproduction shall extend to all documents necessary to permit adequate evaluation of the cost of pricing data submitted along with the computations and Projections used therein.

**120.02 Termination and Disputes.** If the Contract has been terminated, in whole or in part, the records relating to the Work terminated shall be made available to the City for a period of seven years from the date of any applicable final settlement or payment, as applicable. Records which relate to disputes, litigation, or settlement of claims arising out of the performance of the Work shall be made available until such dispute, litigation or settlement has been finally decided or settled.

**120.03 Non-Disclosure by Contractor.** The Contractor shall not disclose, at any time during or after the Work, either directly or indirectly, any confidential records, knowledge or information which the Contractor may acquire about the Project or the City, except as may be required by law or order of a court of competent jurisdiction.

**120.04 Interest.** Moneys owed to the Contractor by the City pursuant to the terms of the Contract Documents, which are not paid when due shall accrue straight interest at the rate paid by the STAR Account, from the date the moneys become due until the moneys are paid. Any contrary provisions of 153.12, 153.13, 153.14 and 153.63, ORC, do not apply to this Contract.

## **CITY OF DAYTON CMS MODIFICATIONS FOR ONLINE BIDDING MODIFICATIONS**

The City of Dayton Construction and Material Specifications Modifications for Online Bidding are hereby modified by this Contract as follows:

1. The definition of Authorized Representative contained in Section 102 shall be removed and replaced with the following:

Authorized Representative: The Authorized Representative for the Contract is the Director of the City of Dayton, Department of Water, or duly authorized designee.

2. The definition of Engineer in Section 102 shall be removed and replaced with the following:

Engineer: The Engineer for the Contract the Chief Engineer – Division of Water Engineering, Department of Water or duly authorized designee.

3. Section 103.36 is hereby removed and replaced with the following:

103.36 Bid Guaranty. The Bidder must file with the Bid a Bid guaranty, payable to the City of Dayton, in the form of the signed Bid guaranty and Contract Bond contained in the Contract Documents, for at least 10% of the full amount of the Base Bid plus any Alternates. The Bid guaranty shall be submitted through the Electronic Bidding Service. The Bid guaranty shall be in form and substance satisfactory to the City and shall serve as an assurance that the Bidder will, upon acceptance of the Bidder's Bid, comply with all conditions precedent for execution of the Contract Form and execute the Contract Form within the time specified by the City. ANY BID GUARANTY MUST BE PAYABLE TO THE CITY OF DAYTON. A Bid may be rejected if the Bid guaranty is payable to any other Person. IF THE BLANK LINES FOR THE AMOUNT ON THE BID GUARANTY AND CONTRACT BOND ARE NOT FILLED IN, THE PENAL SUM WILL AUTOMATICALLY BE THE FULL AMOUNT OF THE BASE BID PLUS ADD ALTERNATES. If those blank lines are filled in, the amount must not be less than the full amount of the Base Bid plus add Alternates, stated in dollars and cents. A PERCENTAGE IS NOT ACCEPTABLE. The Bid guaranty and Contract Bond must be signed by an authorized agent with Power of Attorney from a Surety. The Bid guaranty and Contract Bond must be issued by a Surety authorized by the Department of Insurance to transact business in Ohio. The requirements of Section 3905.41, ORC, may be applicable to require the Bid guaranty and Contract Bond be countersigned by an Ohio resident agent. The Bidder must determine whether this requirement is applicable to the Bidder's Surety. Bid guaranties will be returned to all unsuccessful Bidders seventy-five Days after the Bid Deadline or upon execution of the Contract Form by the apparently successful Bidder, whichever is earlier.

4. Section 106.13 is hereby removed and replaced with the following:

106.13 Construction Schedule. If the Contractor fails to prosecute the Work in accordance with the Construction Schedule, the provisions of Section 105.02 may be invoked.

5. Section 107.19 is hereby removed.

6. Sections 109.05, 109.06, 109.07, 109.08, 109.09, 109.10, 109.11, and 109.12 are hereby removed and replaced with the following:

109.05 Construction Schedule. The Contractor shall prepare a preliminary Construction Schedule within 30-days of the issuance of a Notice to Proceed. The Contractor shall submit the preliminary Construction Schedule in the form of a Gantt Chart. A Gantt Chart consists of a table of project task information and a bar chart that graphically displays the project schedule, depicting progress in relation to time and often used in planning and tracking projects. The Engineer within seven Days of receipt of the preliminary Construction Schedule shall provide written comments to the Contractor. Within 5 days of receipt of the Engineer’s comments, the Contractor shall incorporate the comments and submit a revised Construction Schedule to the Engineer. The Contractor shall update the Construction Schedule every thirty days. The table associated with the Gantt Chart shall be formatted in accordance with the following tables as a minimum:

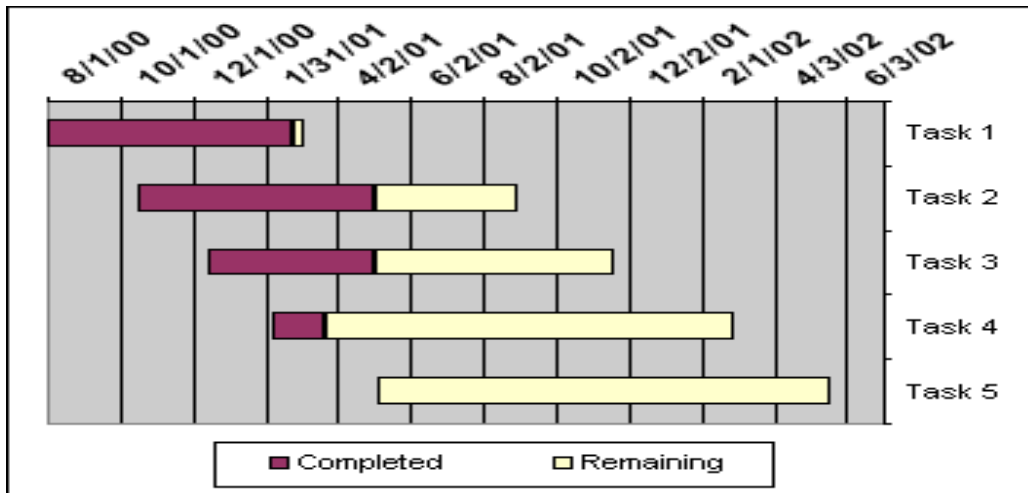
**Sample Gantt Chart Table**

Task ID	Task Description/ Name	Resource Performing Task	Duration of Task (days)	Start Date	Completion Date	Status
1	Submittals	GC	30	5/15	6/15	Done
2	Mobilize/Setup	GC	10	6/1	6/11	10%
3	Site Clearing	Subcontractor	15	6/12	6/27	0%
Etc.	Etc.	Etc.	Etc.	Etc.	Etc.	Etc.

*Note: Table entries are for illustration purposes only.*

1. Task ID: Sequential identifier for task (number, alphabetical, alpha-numeric).
2. Task Description/ Name: Brief description or name of major task items.
3. Resource Performing Task: Individuals or company responsible for completion of task and/or with the majority of the work in the task.
4. Duration of Task: Number of days estimated to complete task.
5. Start/Completion dates: Projected dates.
6. Status: Percent completed, description of status, etc.

**Sample Graphical Representation of Gantt Chart**



109.06 Approval and Acceptance of Contractor Schedule. The Contractor shall review and sign each updated Construction Schedule. The Contractor's signature on any base line or updated Construction Schedule shall serve as an affirmation of the Contractor's approval of and agreement to the Construction Schedule and a representation that the Contractor can meet the requirements of the Construction Schedule without additional compensation.

7. Sections 114.01, 114.02, 114.04, 114.05, and 114.07 are hereby removed and replaced by the following:

114.01 Contractor Payment Request. After confirming the quantities of work performed with the Engineer, the Contractor shall submit monthly to the Engineer an itemized Payment Request, showing the quantities of work performed. The Contractor shall sign the Payment Request thereby certifying that the quantities are correct and the work has been done in accordance with the Contract, and that it constitutes the total amount of work performed during the period. The Contractor shall supply any additional documentation the Engineer may request in connection with each payment to the Contractor. Certified payroll reports for the period of time indicated shall be attached to one copy of every Payment Request. The Contractor shall list on the Contractor Payment Request any approved Change Orders processed and performed during the time covered by the Payment Request.

114.02 Partial Payment. The City shall pay the Contractor an amount equivalent to 90% of the amount listed in each Payment Request within 30 days of the date each Payment Request is executed by the Contractor and approved by the Engineer. After the Contract is 50% complete, as determined by the Engineer, the retainage shall be reduced and the City shall pay 95% of the amount listed in each remaining Payment Request. The amount of Liquidated Damages to which the City is apparently entitled under the Contract Documents may be deducted from any Payment Request by the Engineer and Authorized Representative. Payments due and not paid within such thirty day period shall accrue interest from the date that payment is due under the Contract Documents at the rate paid by the STAR Account in accordance with 120.04.

8. Section 117.06 is hereby removed and replaced with the following:

117.06 Change Order Process. When a change to the Work is ordered, the Engineer shall:

1. Prepare a written request to the Contractor detailing the changes to be made.
2. Reach a written agreement with the Contractor concerning the cost of the Change Order using Unit Prices or the Pricing Guidelines set forth in Section 117.10, whichever the Engineer determines in his or her discretion is applicable.
3. If the cost of the agreed Change Order is less than the available Project Contingency Funds, the Change Order agreement need only be signed by the Engineer.
4. If the cost of the agreed Change Order exceeds the available Project Contingency Funds then the Change Order must be approved by the City Commission and signed by the City Manager. The Contractor may bill for Work covered by the Change Order only after the Change Order is properly executed in accordance with this Section.

9. Section 117.12 is hereby removed and replaced with the following:  
117.12 Time Extension. Notwithstanding any other provision of the Contract Documents, time extensions for changes in the Work will depend upon the extent to which the change causes delay in Work on the Critical Path of the Construction Schedule. If extending the time for Contract Completion is not possible, the Contractor shall price, and separately state, all costs of accelerated performance in the Contractor's Proposal. A Change Order granting a time extension may provide that the time for Contract Completion will be extended for only those specific elements actually delayed and that remaining milestone completion dates will not be altered and may further provide for adjustment of Liquidated Damages, to the fullest extent permitted by law.

**Splash Pad Renovations**

<b>ITEM CODE</b>	<b>ITEM DESCRIPTION</b>	<b>UofM</b>	<b>QUANTITY</b>	<b>UNIT PRICE</b>	<b>EXTENSION</b>
Item 1	Splash Pad Renovations (Five Oaks, Fairview, Mallory, McIntosh, Stuart Patterson, Walnut Hills, & Washington Parks), As Per Plan, Complete	Lump	1		
<b>Alternate No. 1</b>					
Alt. 1	Construction Contingency Allowance (\$150,000.00)	Lump	1	\$150,000.00	\$150,000.00
<b>Alternate No. 2</b>					
Alt. 2	Lohrey Rec. Center Splash Pad, As Per Plan, Complete	Lump	1		
<b>Alternate No. 3</b>					
Alt. 3	Northwest Rec. Center Splash Pad, As Per Plan, Complete	Lump	1		

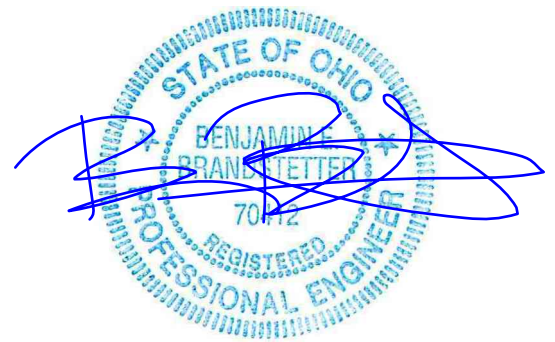
# VOLUME 2 PROJECT MANUAL

for

## DAYTON SPLASH PADS

DAYTON, OH

Project No. 25033  
2A 17772



**BRANDSTETTER  
CARROLL INC**

ARCHITECTS + ENGINEERS + PLANNERS

**April 27, 2026**



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## SECTION 024119 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Refer to DEMOLITION NOTES on sheet within the drawings.

#### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

#### 1.3 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

#### 1.4 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: Hazardous materials have been encountered as outlined in the Asbestos Survey performed by Justice Environmental, Inc.
1. Hazardous materials are to be removed by the contractor in compliance with all applicable laws and regulations.

- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

### 1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that appropriate utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
  - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
  - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
  - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
  - e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

### 3.3 PREPARATION

- A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to facilities to remain.
- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

### 3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  5. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

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.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

#### B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.

### 1.2 DEFINITIONS

- #### A. Cementitious Materials:
- Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.

- #### B. Water/Cement Ratio (w/cm):
- The ratio by weight of water to cementitious materials.

### 1.3 PREINSTALLATION MEETINGS

- #### A. Preinstallation Conference:
- Conduct conference at [Project site] <Insert location>.

### 1.4 ACTION SUBMITTALS

#### A. Product Data:

For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Aggregates.
6. Admixtures:
  - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
7. Vapor retarders.

8. Liquid floor treatments.
9. Curing materials.
10. Joint fillers.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
10. Intended placement method.
11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

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.

## 1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Vapor retarders.
5. Joint-filler strips.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Aggregates.
6. Admixtures:

C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

D. Preconstruction Test Reports: For each mix design.

- E. Field quality-control reports.
- F. Minutes of preinstallation conference.

#### 1.6 QUALITY ASSURANCE

- A. 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 certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

#### 1.7 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.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

#### 1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1.

### PART 2 - PRODUCTS

#### 2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

## 2.2 CONCRETE MATERIALS

### A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, gray.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

### B. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:
  - 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.
  - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

### C. Air-Entraining Admixture: ASTM C260/C260M.

### D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium.

### E. Retain one or more chemical admixtures from "Water-Reducing Admixture," "Retarding Admixture," "Water-Reducing and -Retarding Admixture," "High-Range, Water-Reducing Admixture," "High-Range, Water-Reducing and -Retarding Admixture," and "Plasticizing and Retarding Admixture" subparagraphs below.

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. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

### F. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

## 2.3 VAPOR RETARDERS

### A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A, not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

## 2.4 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: Black.
    - b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
    - c. Ambient Temperature Above 85 deg F: White.
- C. Water: Potable or complying with ASTM C1602/C1602M.
- D. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

## 2.5 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

## 2.6 CONCRETE MIXTURES, GENERAL

- 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 cement in concrete as follows:
  - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
  - 2. Slag Cement: 50 percent by mass.
  - 3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.
  - 4. Total of Fly Ash or Other Pozzolans: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
  - 1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete with a w/cm below 0.50.

## 2.7 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings.
  - 1. Exposure Class: ACI 318 N.
  - 2. Minimum Compressive Strength: 4000 psi at 28 days.
  - 3. Maximum w/cm: 0.45.
  - 4. Slump Limit: 4 inches, plus or minus 1 inch."Slump Flow"
- B. Class B: Normal-weight concrete used for foundation walls and interior slabs-on-ground.
  - 1. Exposure Class: ACI 318 F2
  - 2. Minimum Compressive Strength: 4000 psi at 28 days.
  - 3. Maximum w/cm: 0.45.
  - 4. Slump Limit: 4 inches, plus or minus 1 inch.  
Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
  - 5. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

## 2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish batch ticket information.

## PART 3 - EXECUTION

### 3.1 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.
  - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
  - 3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

### 3.2 INSTALLATION OF VAPOR RETARDER

- 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.

### 3.3 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.
    - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
  3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  6. Space vertical joints in walls. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
- 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.

### 3.4 CONCRETE PLACEMENT

- 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. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
  1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
  1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. 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.
- F. 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.

### 3.5 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
  - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
  - b. Remove projections larger than 1 inch.
  - c. Tie holes do not require patching.
  - d. Surface Tolerance: ACI 117 Class D.
  - e. Apply to concrete surfaces not exposed to public view.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### 3.6 FINISHING FLOORS AND SLABS

A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
3. Apply float finish to surfaces to receive trowel finish.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view.
7. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

### 3.7 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 blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

### 3.8 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 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 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. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. 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 immediately 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.
      - 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, 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.
- 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.
    - 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, 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.
    - 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.

### 3.9 TOLERANCES

- A. Conform to ACI 117.

### 3.10 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 is rough or porous.
- 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.

### 3.11 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 shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
  - 2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  - 3. Testing agency shall 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 shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, 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.
  - 13) Information on storage and curing of samples before testing, 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.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
1. Headed bolts and studs.
  2. Verification of use of required design mixture.
  3. Concrete placement, including conveying and depositing.
  4. Curing procedures and maintenance of curing temperature.
  5. Verification of concrete strength before removal of shores and forms from beams and slabs.
  6. 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 shall 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 50 cu. yd. or fraction thereof.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall 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 placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  3. Slump Flow: ASTM C1611/C1611M:
    - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;

- a. One test for each composite sample, 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 and above, and one test for each composite sample.
6. Unit Weight: ASTM C567/C567M fresh unit weight of 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.
7. Compression Test Specimens: ASTM C31/C31M:
  - a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39/C39M.
  - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
  - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests 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.
11. 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.
12. Additional Tests:
  - a. Testing and inspecting agency shall 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 shall be in accordance with ACI 301 section 1.6.6.3.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

### 3.12 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 055000 - METAL FABRICATIONS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Shelf angles.
3. Miscellaneous steel trim.
4. Loose bearing and leveling plates.
  
5. Swing Gates

##### B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

#### 1.2 ACTION SUBMITTALS

##### A. Product Data: For the following:

1. Paint products.
2. Grout.

##### B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

##### C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data, signing and sealing by the qualifying professional engineer responsible for their preparation.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

##### A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.

##### B. Structural Performance of Aluminum Ladders: Aluminum ladders shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

- 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304 .
- D. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- F. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

## 2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
  - 1. Provide stainless-steel fasteners for fastening aluminum.
  - 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or as indicated.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- D. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

## 2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with other sections.
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- F. Concrete: Comply with requirements in other sections for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

## 2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
- E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches from ends and corners of units and 24 inches o.c.

## 2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

## 2.7 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Hot dip galvanize shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

## 2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.
- D. Prime exterior miscellaneous steel trim with zinc-rich primer.

## 2.9 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

## 2.10 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

- B. Galvanize loose steel lintels located in exterior walls.
- C. Prime loose steel lintels located in interior walls with zinc-rich primer.

#### 2.11 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

#### 2.12 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.

#### 2.13 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Shop prime with universal shop primer unless zinc-rich primer is indicated elsewhere.
- C. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
  - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.

Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

### 3.2 INSTALLING METAL BOLLARDS

- A. Anchor bollards in place with concrete footings. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- B. Fill bollards solidly with concrete, mounding top surface to shed water.

### 3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 131211 – SPRAY PADS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Scope
- B. Contractor Experience Requirements
- C. Manufacturer Experience Requirements
- D. Regulatory Requirements
- E. Drawings
- F. Substitutions
- G. Start-up Operations
- H. Warranties

1.02 SCOPE

- A. Basis of Design: The Sprayground Water Features and all related Sprayground equipment detailed in the drawings and specifications are based on a system manufactured by Vortex International: Equipment manifold, and controller are owner provided.
- B. All aspects of design which include pump sizes, pipe sizes, supply manifold, feature anchors and foundations electrical supply requirements and underground reservoir are based on the performance requirements of Vortex equipment.

1.03 CONTRACTOR EXPERIENCE REQUIREMENTS

- A. All work under this section must be performed by a Contractor experienced and regularly engaged in installing public, “Spraygrounds”, “Splash Pads”, “Spray Parks”, “Aquatic Playgrounds”, or any similar type facility as described in these Contract Documents.
- B. Contractors bidding this work must submit a list of 10 similar projects installing Splash Pads within the past 10 years with their bid.

1.04 REGULATORY REQUIREMENTS

- A. All work under this Division shall be inspected and installed in accordance with all current local and state codes and regulations.

- B. All materials and operations which are referenced to a published standard shall comply with the current specification or standard listed. All labor, material, and equipment necessary to complete all work required by the plans and in these specifications shall be furnished under this Division

#### 1.05 DRAWINGS

- A. Piping locations shown on plans are schematic and precise locations shall be determined by actual field conditions by the Contractor and submitted to Architect for review.
- B. The Contractor shall include all fittings normally required for a complete installation of the system.
- C. Drawings are not to be scaled.
- D. The Contractor shall prepare and submit shop drawings and equipment cuts to the Architect/Engineer for approval before ordering materials and equipment.

#### 1.06 FLOW METERS

- A. Flow meters shall be installed on the discharge line of each circulation pump.
- B. Flow meter to be installed so as to have an undisturbed water flow 10 pipe diameters upstream and 5 pipe diameters downstream or per manufacturer's specifications.
- C. Flow Meter Types:
  - 1. Acrylic, impact type flowmeter w/ printed scale.
- D. Flow meters to be installed per manufacturer's recommendations and have all components required for a complete installation.
- E. Acceptable Manufactures
  - 1. Blue / White

#### 1.07 START-UP OPERATIONS

- E. At the completion of the work, the Contractor shall furnish to the Owner 3 bound copies of an operating manual. Minimum content of these manuals shall be:
  - 1. Operating and winterizing instructions.
  - 2. Equipment literature with parts list of all new equipment.
  - 3. Suggested safety procedures.
  - 4. The Owner shall be responsible for furnishing water and filling the Sprayground reservoir as part of the job completion. Contractor shall instruct the Owner's operating personnel in the operation of all new equipment. (Video taping may be performed by Owner, if desired.)

5. Contractor shall furnish and supply start-up chemicals as required for start-up, including chlorine and requirements to balance Total Alkalinity and Calcium Hardness.
6. At the end of the first year, the Sprayground contractor shall maintenance the pool and equipment and instruct Owner's personnel in this procedure.

B The qualified individual from the Sprayground manufacturer company shall be required to visit the Job site to start up and adjust the new system and train the Owner in the operation of the Sprayground features.

#### 1.08 WARRANTIES

1.08.1 The Contractor shall warranty his work, against defects in labor and equipment for a period of (2) two years from Substantial Completion. Such documentation shall be submitted to Owner prior to release of final payment.

1.08.2 Substantial Completion shall be defined as the date of acceptance by the Architect/Engineer or initial usage, whichever occurs first.

END OF SECTION



## SECTION 131213 – SPRAY PAD EQUIPMENT

## PART 1 - GENERAL

## 1.0 GENERAL SCOPE

1.1 SECTION INCLUDES: Under this item, the Contractor shall furnish all labor, materials, equipment and perform all operations necessary for the completion of the work as shown on the drawings. This includes, but is not limited to all excavation, concrete footings, required backfill, hardware, fittings, nozzles, piping, wiring, and accessories, including the aquatic play pad controller, water management systems, and finishes as required, in accordance with the drawings, specifications and directions of the Owner's Representative.

## SYSTEM DESCRIPTION

## Design Requirements:

The installation shall be as indicated on the drawings, and in accordance with the manufacturer's recommendation as reviewed and approved by the owner. The installation shall be accomplished by skilled work personnel that is certified to install the specified material(s).

## 1.2 SUBMITTALS

## Product Submittals:

1. Contractor shall submit digital shop drawings for review before beginning work.
2. Submit manufacturer's product data for aquatic play features and system components including vault, activator(s), water treatment system including UV sterilization if applicable, pipes, fittings and valves.
3. Submit drawings to indicate layout of aquatic play area components and location of anchors and footings. Clearly indicate, to scale the spatial relationship of each piece of equipment to each other and to other existing or proposed features including adjacent surfaces or vegetation. Indicate to a scale the limits of spray zones and non-encroachment areas to clearly demonstrate conformance with specified standards.
4. Submit shop drawings of the aquatic play features including spray nozzles and colors, for approval.

## Closeout Submittals:

1. Comply with requirements included as part of the contract documents.
2. All aquatic play features are to carry a minimum warranty of two (2) year on all workmanship and materials. Submit warranty to Owner.
3. Provide maintenance and winterizing data.

## 1.3 SUBSTITUTIONS

1. If proposing a substitute equipment manufacturer. Contractor must provide the following:
  - a. A chart detailing any and all interactivity, control, data logging and access, data reporting, aesthetic, flow, size, material, performance or any other product characteristics that do not match the specified aquatic play pad.
  - b. A written description of the aquatic play pad operational sequence.
  - c. Detailed color product cut sheets for all aquatic play features, water management systems, controllers including detailed descriptions and screen shots of the on-line access and reporting systems software.
  - d. Letter from manufacturer stating that the proposed spray features, controls and park operational and maintenance programs are a part of the manufacturer's standard product catalog and have been manufactured and installed on at least five (5) other similar projects. If any of the items being proposed are custom features, the manufacturer should then provide references from at least two previous clients who have purchased elements from them.

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2. Product installation details.
  - a. Spray radius layout including correct overspray zones as indicated on the provided plans.
3. Plumbing and electrical diagrams
  - a. Water flow and pressure calculations for all features, pipes, fittings, connections, valves and related plumbing stamped by a registered in the state of Ohio, confirming that the proposed design meets the flow requirements and maximum velocities and/or the current building codes.
  - b. Signed letter from the proposed equipment manufacturer stating that they will pay for all costs (engineering, redesign, construction drawings) that may arise due to any variation from the specified manufacturers plans and total system design.
  - c. All proposed substitutions must be approved by the local Health Authority prior to submission (when applicable). Plans not approved prior to submission will be rejected.

#### 1.4 QUALITY ASSURANCE

1. It shall be the obligation of the Contractor to insure that all criteria are satisfied and the burden or proof of conformance shall rest with the contractor. The Engineer shall require complete calculation, past performance records, and if required, inspection trips of similar facilities to substantiate conformance with these criteria. The Engineer shall be the sole judge of conformance and the Contractor is cautioned that he will be required to Bid and provide a finished product meeting all stated criteria. It is recommended that the contractor or project manager follow an inspection and approval process, as provided by manufacturer.

#### Manufacturer's Qualifications:

1. Manufacturer shall have a minimum 10 years experience in the manufacture of aquatic play features and components. The person(s) responsible for installation shall have supervised/installed a minimum of 3 (three) installations in the State of Ohio.
2. The person(s) responsible for installation shall be on-site performing such service.
3. Licensed plumbers and electricians shall be used as required by local codes.
4. General contractor shall have experience managing the installation of at least three (3) previous splash pads.

#### Storage and Protection:

1. Protect pre-finished metal from abrasion and corrosion during storage and assembly.
2. DO NOT remove packaging from components prior to pouring final slab.

#### Product Delivery:

1. Deliver materials to job site in an undamaged condition.
2. Inspect all items for abraded surfaces and other unacceptable deliver conditions. Return damaged or non-conforming items to manufacturer for replacement.
- 3.

#### 1.5 SITE CONDITIONS

##### Temperature and Weather Requirements:

1. Substrate Requirements:
  - a. Do not place concrete on muddy or frozen substrate.
  - b. Remove mud, dirt, and ice from formwork surfaces.

##### Existing Conditions:

1. Locate underground utility systems and other below grade site improvements in area of surface and footing excavations.
2. Call OHIO811 for underground utility locations in advance of excavation, removing soil materials and boring post holes.

## PART 1 – PRODUCTS

## 2.0 MANUFACTURER

1. Basis of Design: Aquatic play features and water management systems shall be Waterplay® named designs and model numbers, as manufactured by Waterplay by MAKR, 805 Crowley Ave, Kelowna, BC Canada V1Y 7G6 OR APPROVED EQUAL
2. All equipment shall be installed in accordance with the installation specifications. The contractor shall use due care when installing the features. Protective wrapping shall be left intact throughout the installation and be removed only upon completion. Structures shall be installed in accurate locations, square, centered, plumbed, and at the required elevation relative to final grade on footings as per the layout.
3. All phases of the installation shall be inspected by the owner, or an authorized representative of the owner, up to and including the final inspection as laid out by the manufacturer.

## 2.1 PRODUCTION CONSTRUCTION:

1. Above ground aquatic play features shall be constructed of Stainless Steel Type A304 or A304L, schedule 40 or 10. Stainless steel base plate materials will be 2B finish at 3/8” thick. Each spray fixture shall have a 1 ½” NPT coupling water inlet.
2. In-ground aquatic play features shall be 2 ½” schedule 80 or 6” schedule 80, type A304 stainless steel canisters with a machined nozzle seat. Each fixture will have a 1” NPT coupler water inlet. Each fixture shall have mounting holes to accommodate stainless steel L-type anchor bolts to be set in a concrete footing.
3. Aquatic play features are to meet ADA compliance for handicap accessibility, and meet or exceed current ASTM playground safety standards.
4. Aquatic play features will be supplied with all necessary anchoring hardware and installation templates to accommodate site work.
5. Aquatic play features anchoring system shall provide the ability to add, remove and interchange products without having to change infrastructure and footings. The component shall be fastened directly to the base flange with an EPDM gasket to provide a water tight seal between the component flange and the base flange. The base must be flush-to-grade with no visible hardware or dome cover. The base must have the ability to attach a grounding lug.
6. All aquatic play features shall have fittings that allow for winter close off.
7. All aquatic play features of below grade design shall address winterization.

## 2.2 NOZZLES

1. Aquatic play feature nozzles shall be constructed of acetal copolymer or urethane. Nozzles shall be non-corrosive, impervious to galling, precision machined. Brass and Nylon are not acceptable. A mechanical workbook must be supplied to show individual flow rates for each feature including maximum and average flow for each pre-programmed sequence step.
2. Nozzles shall be secured using stainless steel fasteners.

## 2.3 COATINGS

1. Fixtures shall receive a pre-treatment stainless steel epoxy primer followed by a coat of weather-resistant super durable TGIC free polyester powder, baked application. Standard powder coatings are not acceptable. Brushed stainless finish is the exception.
2. Powder coatings shall be weather resistant and have ultraviolet inhibitors. Coatings shall have a high gloss finish, have ultraviolet inhibitors, withstand 1/10th no removal @160 in/lb, exceed all specifications of organic coatings, and a film thickness of between 2.5 to 3.0 mils (determined by color and finish). Where theme graphics are applied, a base clear coat system will be applied. Supply aerosol primer and touch up paint, color code as specified for aquatic play features.

2A 17772

3. Equipment must be packaged in a three step packaging process as follows:
  - a. The first layer is open cell 1/8" foam wrapping.
  - b. The second layer is a corrugated cardboard.
  - c. The final layer is a waterproof polyethylene tarp wrap.
4. Product must be shipped in dedicated nose load shipments secured with strapping.

## 2.4 ELECTRICAL

1. All electronic operating systems shall be provided by the aquatic play feature manufacturer.
2. All electrical control panels shall be UL/CUL approved specifically for aquatic play area operations and must bear certification logos.
3. All wiring to be specified by the manufacturer of the aquatic play features.
4. The actuating device shall be encapsulated within a 304 stainless steel casing and be UV, moisture, graffiti, and impact resistant.
5. All control system materials are to be of industrial grade quality and controller enclosures shall be rated @ NEMA 4.
6. All aquatic play feature components shall be grounded using bare #6 AWG wire and an approved ground lug. Consult local electrical inspector for local codes and final inspection. All codes must be met.
7. Electrical connection shall be 1" National Pipe Thread (NPT) coupler to be located near the bottom of the component.
8. Power supply to the aquatic play feature control panel shall be 120V AC, with a 15amp GFCI dedicated breaker
9. All wire connections must be watertight.
10. Solenoid valves must be PVC, and of type having 24V AC, 0.250 mA max. holding current coil rating with flow control (Rainbird PGA series or equal). Valve wire shall be #18 AWG type R90, one per valve, plus one common back to the controller location.

## 2.5 WATER DISTRIBUTION AND MANAGEMENT SYSTEM

1. Main line pipe and fittings to be schedule 80 PVC or greater. The distribution laterals and fittings are to be schedule 80 PVC or greater. Ensure that a proper slope is consistently applied to all piping to ensure positive gravity-assisted drainage of the entire system. Ensure all fittings are secured to close openings (off season) to protect from water entry of water back into the piping system. (See nozzles section).
2. Solenoid valves must be PVC, and of type having 24V AC, 0.250 mA max. holding current coil rating with flow control (Rainbird PGA series or equal). Valve wire shall be #18 AWG type R90, one per valve, plus one common back to the controller location.

## 2.6 ACCESSORIES

1. All hardware, fittings and fastenings shall be as indicated on the shop drawings and may be required to complete the installation. Anchor fasteners to be stainless steel.
2. Lag bolts shall be stainless steel with flat type vandal-proof head in size indicated on plans. Anchors shall be stainless steel in size required. (tamper proof hardware shall be stainless steel, complete with owner supplied hardware security tools).

## 2.7 FEATURE SPECIFICATIONS (BASIS OF DESIGN)

PRODUCT CODE AT-13981-01  
Activity Tower McIntosh Park

Characteristics Provide an interactive play structure that includes a 2' and 4' elevated platform, multiple play features, and a waterslide with a landing mat. Aquatic Play Structure to be the AT-13981-01 from Waterplay, or equal. Features associated with the play structure include the following list of features: Aqua Drop, Aquafall, Bobble Cannon, Deck Spray, Encore, Splash Blaster, Splasher, Spray Cap, and Water Brolly.

The outside supporting columns of the main pod shall incorporate playCONNECT™, an interchangeable system which allows for a modular assembly. The features below shall use the playCONNECT system, allowing them to be interchanged

Encore  
Water Brolly  
Aqua Drop  
Spray Cap

The below items shall incorporate 360° rotational hubs with grab handles accessible from on the structure's upper panels:

Aquafall  
Bobble Cannon  
Splash Blaster  
Splasher

The Aquafall provides interactive play on the outside of the lower panels.  
The Deck Spray shall house an interchangeable spray nozzle that sits flush with the surrounding deck surface, providing incidental water onto the rotomolded slide.  
The fiberglass slide exists from the 4' high platform with an open flume. It measures 50" wide. The exit is a 54"x120"x2" thick mat that is made with a textured slip resistant EVA material and meets ASTM-1292 critical fall height requirement of up to 7'

A single water supply line is to be plumbed to the central column of each platform. All play features are to be plumbed beneath the decking, concealed from view, and each controlled via an independent flow control valve. Lower panels prevent access to the area under the structure. A removable panel secured with tamper resistant stainless-steel hardware provides access for flow adjustment and maintenance.

The main structure shall be made of stainless steel with all walkable surfaces coated in a textured anti-slip powdercoat. These surfaces shall be perforated for drainage and removable via tamper resistant stainless-steel fasteners to support ease of installation and maintenance.

The entry shall include both a standard stair entry as well as an ADA accessible transfer station.

Acrylic panels enclose the top play area of the structure and provide visibility for a safe clear line of site.

The structure is levelled and secured to the concrete foundation using patent pending 316 stainless steel anchor hardware. The anchor hardware includes a machined slip washer and narrow nut assembly that allow the structure to be levelled and secured in place after assembly.

Dimensions:

The overall height of the structure shall be no less than 14'8" (4469 mm) above final grade. The overall width of the structure will be 19'11" (6063 mm)

PRODUCT CODE            0010-1854  
Power Post

Characteristics            The Power Post Activator column shall be constructed of schedule 10 stainless steel structural tubing measuring 42.55 inches (1081mm) tall. There shall be 1 10 inch (254mm) acrylic mounting panel on top of the column anchored at 45° with 1 push button activator in the centre. Tamper resistant fasteners shall be used to hold all components together.

Dimensions:                The overall height of the structure shall be no less than 42.55 inches (1081mm) above final grade. The overall width of the structure shall be no less than 8.79 inches (223mm)

Anchoring/Levelling System:            See ePHASE Small written spec for more detail.

PRODUCT CODE 0011-6404  
CIRCLE DRAIN WITH STRAINER

Characteristics The drain body shall be made from HDPE and include a perforated stainless-steel grate with slip resistant textured powder coat. The drain grate shall be secured with two tamper resistant fasteners. Four slotted feet shall allow for secure and level installation of the drain body, while an aluminum blank cover installed on top of the grate ensures the drain remains clear of debris during installation. The drain body shall include an inner lip to accommodate a drop-in stainless steel strainer basket. The strainer basket shall include a grab handle to facilitate easy removal for cleaning.

The bottom of the drain body shall allow for on-site modification in order to accommodate an optional bottom outlet connection kit. This second outlet allows the drain to be connected to two separate drainage lines such as municipal sanitary and storm. Plugs shall be included in the outlet kit in order to cover and block each outlet.

Dimensions: The overall height of the drain shall be no less than 17 inches (432 mm). The overall diameter of the drain shall be no less than 18 inches (447 mm). The outlet shall accommodate a minimum drainage pipe size of 6 inches.

Recommended Flow The flow capacity of the drain through the 6 inch pipe is 200 GPM (760 LPM),  
Rate: based on a 6 inch drain pipe at 2% slope.

PRODUCT CODE	0011-4283 Aneth Bloom 3
Characteristics	The Aneth Bloom 3 shall be constructed of stainless steel, consisting of a main continuous bend column with three (3) curved support arms and flanges welded to one another. Each supporting arm shall house a urethane nozzle insert with acetal nozzle. Five (5) secondary branching arms shall be bolted to each support arm flange with stainless steel hardware. The supporting arms shall support three (3) acrylic perforated panels. Water will flow through three (3) acetal nozzles secured in the top of the supporting arms, cascading off and through the acrylic panels.
Dimensions:	The overall height of the structure shall be no less than 155 inches (3948mm) above final grade. The overall width of the structure shall be no less than 80 x 90 inches (2043 x 2284mm).
Recommended Flow Rate:	The hydraulic requirements shall be 18 gpm @ 8 psi (68 lpm @ 55 kpa).
Nozzle Count	Three (3)
Anchoring/Levelling System:	See Playphase Base Medium written specs for detailed information.

PRODUCT CODE 0011-4255  
Aqua-Drop

Characteristics The Aqua-Drop column shall be constructed of stainless steel with a continuous bend. Two (2) 180° bends will be welded to one another forming a full loop, and affixed to the top of the main column. An AquaLume bucket with capacity of 3.5-4 gallons (13.2-15.2 litres) shall be suspended in the center of the circle with a stainless steel spindle. Water will flow through the water supply holes on the bucket spindle. Once at capacity for gravity rotation, the dumping bucket will be emptied downward, causing the bucket to return to its starting position.

Dimensions: The overall height of the structure shall be no less than 132 inches (3354mm) above final grade. The overall width of the structure shall be no less than 52 inches (1321mm).

Recommended Flow Rate: The hydraulic requirements shall be 10 gpm @ 7 psi (38 lpm @ 48 kpa).

Anchoring/Levelling System: See Playphase Base Medium written specs for detailed information.

PRODUCT CODE 0011-4256  
Aqua-Knot

Characteristics The Aqua-Knot column shall be constructed of stainless steel pipe with a mounting flange welded at the end. The trumpet head shall be constructed of rotomolded HDPE and secured to the mounting flange using a urethane flange collar with tamper resistant security hardware. One (1) 2 1/2" acetal nozzle with sixteen (16) holes drilled in a circular pattern shall be mounted in the center of the trumpet head. Water flows through the trumpet head in a downward geyser. A blank nozzle shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 133 inches (3383mm) above final grade. The overall width of the structure shall be no less than 25 x 54 inches (641 x 1365mm).

Recommended Flow Rate: The hydraulic requirements shall be 5 gpm @ 6 psi (19 lpm @ 41 kpa).

Anchoring/Levelling System: See Playphase Base Medium written specs for detailed information.

PRODUCT CODE 0011-4392  
Big Top Soaker

Characteristics The Big Top Soaker shall consist of the three (3) support columns constructed of schedule 10 stainless steel structural tubing. Two angled support columns shall support two 180° bends to form a 59 inch (1498mm) cradle. A clear acrylic bucket with a capacity of 30 gallons (114 litres) shall be suspended in the middle of the cradle. The acrylic bucket will fill with water and tip onto an adjustable stainless steel splash plate that sits 111 inches (2819mm) above grade on an angled support column. Water will flow through the water supply holes on the bucket spindle. The spindle is angled towards the direction the bucket is to rotate. Once at capacity for gravity rotation, the dumping bucket will be emptied downward.

Dimensions: The overall height of the structure shall be no less than 178 inches (4521mm) above final grade. The overall width of the structure shall be no less than 61 x 59 inches (1549 x 1498mm).

Recommended Flow Rate: The hydraulic requirements shall be 30 gpm @ 10 psi (113 lpm @ 69 kpa).

Anchoring/Levelling System: See Playphase Base Medium written spec for more detail.

PRODUCT CODE           0011-4261  
Candy Cane

Characteristics           The Candy Cane column shall be constructed stainless steel with a bend at the top. The Candy Cane shall have an acrylic wheel mounted to the main column allowing for control of the flow of water as the wheel is rotated. At the end of the bend an acrylic nozzle assembly shall be affixed using tamper proof stainless steel hardware. As the acrylic wheel is rotated, the water display through the acrylic nozzle streams changes as a result of the change in flow. Water shall flow through the nozzle in the end of the candy cane column in a gentle shower. The acrylic wheel shall change the spray diameter as it is rotated.

Dimensions:               The overall height of the structure shall be no less than 115 inches (2916mm) above final grade. The overall width shall be no less than 35 inches (889mm).

Recommended Flow Rate: The hydraulic requirements shall be 5 gpm @ 4 psi (19 lpm @ 28 kpa).

Nozzle Count             One (1)

Anchoring/Levelling System:       See Playphase Base Medium written specs for more information.

PRODUCT CODE 0010-0485  
Funbrella

Characteristics The Funbrella column shall be constructed of schedule 10 stainless steel structural tubing. The column shall contain a top cap at the column end and allow for the free flow of water. Water flows out of the top nozzle cap creating a cascading umbrella.

Dimensions: The overall height of the structure shall be no less than 37 inches (939mm) above final grade.

Recommended Flow Rate: The hydraulic requirements shall be 14 gpm @ 2 psi (53 lpm @ 14 kpa).

Anchoring/Levelling System: See Playphase Base Small written spec for more detail.

PRODUCT CODE 0011-4269  
Helices

Characteristics The Helices column shall be constructed of schedule 40 stainless steel structural tubing with two structural bends. A 2 1/2" acetal nozzle shall be mounted in the end of the column. Water will flow through one (1) 2 1/2" acetal nozzle secured in the top of the main column creating an arching water stream. One (1) blank acetal nozzle shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 133 inches (3378mm) above final grade. The overall width of the structure shall be no less than 41 inches (1041mm).

Recommended Flow Rate: The hydraulic requirements shall be 3 gpm @ 9 psi (11 lpm @ 62 kpa).

Anchoring/Levelling System: See Playphase Base Medium written spec for more detail.

PRODUCT CODE 0011-1518  
Hula-Hooper

Characteristics The Hula-Hooper consists of a curved column constructed of 3 inch schedule 10 stainless steel structural tubing. Each side of the hoop as one (1) smaller hoop within the structure of the same material. Each smaller hoop shall have a spindle extension installed inside the curve. Each spindle extension shall have a splash orb feature installed. The splash orbs consist of two (2) blank urethane panels, one (1) slotted urethane panels, acrylic separator plates and one (1) Blue Bottle nozzle installed in the end. Five (5) adjust-o stream nozzles shall be installed in the upper portion of the hoop in equal distances. Tamper resistant fasteners shall be used to hold all components together to prevent leakage. Two (2) blank acetal nozzles shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 47 inches (1185mm) above final grade. The overall length x width shall be no less than 27 inches x 11 inches (696mm x 268mm).

Recommended Flow Rate: The hydraulic requirements shall be 22 gpm @ 4 psi (83 lpm @ 28 kpa).

Anchoring/Levelling System: See Playphase Base Small written spec for more detail.

PRODUCT CODE 0011-4314  
Mega Soaker

Characteristics The Mega Soaker shall consist of the three (3) support columns constructed of schedule 10 stainless steel structural tubing. Two support columns shall support bends to create a 180° top bend to form a cradle for the bucket assembly. An aluminum bucket shall be mounted in a 50-inch (1270mm) diameter shell with no top. The bucket shall have a capacity of 35-40 gallons (132.5-151.4 litres) and shall be suspended in the middle of the cradle by a bucket spindle. The aluminum bucket will fill with water and tip onto an adjustable stainless steel splash plate that sits on an angled support column. The curved stainless steel splash plate shall have a diameter of no less than 48 inches (1219mm). Water will flow through the water supply holes on the bucket spindle. Once at capacity for gravity rotation, the dumping bucket will be emptied downward spilling onto the angled splash plate, dispersing the water in a broad splash.

Dimensions: The overall height of the structure shall be no less than 207 inches (5257mm) above final grade. The overall width of the structure shall be no less than 87 x 75 inches (2209 x 1905mm)

Recommended Flow Rate: The hydraulic requirements shall be 40 gpm @ 10 psi (151 lpm @ 69 kpa).

Anchoring/Levelling System: See Playphase Base Medium written spec for more detail.

PRODUCT CODE 0010-1448  
Morning Grass 1

Characteristics The Morning Grass No.1 feature columns shall be constructed of schedule 10 stainless steel structural tubing. Each column shall have a 48° bend. The top of each column shall be MITRE cut and must mirror the opposite column. Cut bend left and cut bend right shall be seamlessly welded together at the top. Two (2) acetal nozzles shall be installed on the left side of the blade and two (2) acetal nozzles shall be installed on the right side of the blade at offsetting positions. Two (2) 3/4" acetal fan nozzles are mounted on the inner curve of each column at staggered positions creating a downward fan mist from the feature. Four (4) blank acetal nozzles shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 117 inches (2971mm) above final grade. The overall width of the structure shall be no less than 29 x 29 inches (736mm x 736mm)

Recommended Flow Rate: The hydraulic requirements shall be 3 gpm @ 4 psi (11 lpm @ 28 kpa).

Anchoring/Levelling System: See Playphase Base Small written spec for more detail.

PRODUCT CODE 0011-4288  
Mr. Ribbit

Characteristics Mr. Ribbit shall consist of three (3) support columns constructed of 5 inch schedule 10 stainless steel structural tubing. The upper structure and bucket supports shall be constructed from 3 inch schedule 10 stainless steel. Two (2) 20 inch x 10.38 inch (508mm x 264mm) AquaLume buckets with water capacities of 3.5-4 gallons (13.2-15.2 litres) shall be suspended in the center of the supports with a 1 inch (25.4mm) spindle. Two (2) lower arms shall each support an oval acrylic splash plate 16 x 24 Inches (406mm x 610mm). An water wheel made of two (2) 1/4 inch acrylic panels shall be mounted between the two (2) rear support columns. Six (6) acetal nozzles mounted on the rear support legs along with one (1) urethane nozzle cap mounted on the upper support structure shall will flow water onto a 1/4 inch thick acrylic panel. Each rear support column shall have five (5) threaded acetal fan nozzles at equally spaced intervals. Tamper resistant fasteners shall be used to hold all components together to prevent leakage. Eighteen (18) blank acetal nozzles shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 181 inches (4595mm) above final grade. The overall length and width of the structure shall be no less than 166 x 111 inches (4221 x 2808mm).

Recommended Flow Rate: The hydraulic requirements shall be 34 gpm @ 10 psi (129 lpm @ 69 kpa).

Anchoring/Levelling System: See Playphase Base Medium written spec for more detail.

PRODUCT CODE 0011-1119  
Sling Soaker

Characteristics The Sling Soaker consists of a curved column constructed of 5 inch schedule 10 stainless steel structural tubing branching to two (2) 3 inch schedule 10 stainless steel tubing arms. An AquaLume bucket with a water capacity of 4 gallons (15.2 litres) shall be suspended in between the two (2) arms with a 1 inch (25.4mm) spindle. The bucket dumps water onto a splash pad constructed of 1/4 inch (6mm) acrylic. Tamper resistant fasteners shall be used to hold all components together to prevent leakage.

Dimensions: The overall height of the structure shall be no less than 147 inches (3736mm) above final grade. The overall length x width shall be no less than 46 inches x 27 inches(1156mm x 684mm).

Recommended Flow Rate: The hydraulic requirements shall be 20 gpm @ 8 psi (76 lpm @ 55 kpa).

Nozzle Count N/A

Anchoring/Levelling System: See Playphase Base Large written specs for detailed information.

PRODUCT CODE           0010-0403  
                                  Splash Blaster

Characteristics           The Splash Blaster column and cannon head assembly shall be constructed of schedule 10 stainless steel structural tubing. A revolving hub with no pinch points shall be mounted in the feature base column. The revolving hub will allow for 360° rotation with a 120° spray radius. The cannon head assembly shall have a 90° bend with a urethane nozzle cap with acetal nozzle mounted in the end. A schedule 40 stainless steel tube shall have a diameter of 8 inches 203(mm) with a ø3.5 inch (12mm) opening which shall be welded to the head assembly as a handle. Water flows through one (1) nozzle with seven (7) holes in an outward wave from the cannon head assembly.

Dimensions:               The overall height of the structure shall be no less than 34 inches (876mm) above final grade. The overall width of the structure shall be no less than 13 x 9 inches (332 x 236mm)

Recommended Flow Rate: The hydraulic requirements shall be 3 gpm @ 7 psi (11 lpm @ 48 kpa).

Anchoring/Levelling System:           See Playphase Base Small written spec for more detail.

PRODUCT CODE	0010-7472 Surf Stone #2
Characteristics	The Surf Stone 2 is hand-crafted using coloured concrete with a sand-blasted surface to mimic the texture and feel of a true stone.
Dimensions:	The Surf Stone 2 shall be 11 inches (282 mm) tall at its highest point of the stone and gently slopes towards the edge of the stone. The stone shall be 28 inches (711mm) in length and at its widest point measure 19 inches (493mm).
Recommended Flow Rate:	The hydraulic requirements shall be 5 gpm @ 15 psi (19 lpm @ 103 kpa).
Nozzle Count	One (1)
Water Display:	Water will flow through one(1) 2 1/2" acetal nozzle in the base of the feature and through twelve (12) holes in a curved line on the top of the feature creating a gentle arch and cascading over the stone.
Anchoring/Levelling System:	The Surf Stone 2 shall be surfaced mounted using two treaded rods, epoxy and sikaflex.

PRODUCT CODE 0010-1590  
Twisty Tango

Characteristics The Twisty Tango base and spindle shall be constructed of schedule 10 stainless steel structural tubing. The spindle assembly shall be mounted on top of the base and be stacked with three (3) drums separated by two (2) acetal collars. Each drum shall have two (2) threaded acetal fan nozzles mounted in the center of the drum on opposite sides. The nozzle threading should be recessed into the tubular section and welded with a watertight, full penetration, polished and non-visible weld. The top drum will be finished with a 10 inch (254mm) circular acrylic plate. Tamper resistant fasteners shall be used to hold all components together to prevent leakage. The spindle assembly will allow for 360° rotation, shall be free of pinch points and protrusion hazards and contain no flexible hoses. Each of the three (3) Misty Twisty rotating sections shall have two (2) 3/4" acetal fan nozzles on opposing sides creating an outward misting spray. The rotational hubs allow for 360° rotational spray on each of the three (3) sections. Six (6) blank acetal nozzles shall be provided for winterization.

Dimensions: The overall height of the structure shall be no less than 47 inches (1193mm) above final grade. The overall width of the structure shall be no less than 10 inch (254mm) diameter.

Recommended Flow Rate: The hydraulic requirements shall be 3 gpm @ 4 psi (11 lpm @ 28 kpa).

Anchoring/Levelling System: See Playphase Base Small written spec for more detail.

PRODUCT CODE 0010-0418  
Wiggly

Characteristics The Wiggly columns shall be constructed of schedule 10 stainless steel structural tubing. The top and bottom assembly shall be joined by a spindle assembly. The spindle assembly rotational joint shall allow for 120° rotation, be free of pinch points and protrusion hazards and contain no flexible hoses. A urethane nozzle cap shall be mounted in the end of the upper column and be secured in place with tamper resistant hardware. One (1) urethane nozzle cap shall be mounted in the end of the column creating an angled upward geyser.

Dimensions: The overall height of the structure shall be no less than 34 inches (863mm) above final grade. The overall width of the structure shall be no less than 12 inches (304mm)

Recommended Flow Rate: The hydraulic requirements shall be 3 gpm @ 5 psi (11 lpm @ 34 kpa).

Anchoring/Levelling System: See Playphase Base Small written spec for more detail.

PRODUCT CODE 0010-7494  
GS Doughnut

Characteristics The eight (8) spray canisters shall be connected to a 45 x 40 inch (1143 x1016mm) square stainless tubing weldment acting as a manifold. Each canister shall be no less than 6 inches (152mm) tall with a diameter of Ø2.88 inches (73mm). The Acetal spray nozzles and winter caps shall be seated into the canister with an o-ring and secured using tamper resistant security bolts.  
Tamper resistant winter caps are included. All nozzles sit flush with final grade. There shall be two 1 inch (25mm) National Pipe Thread water inlets.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 24 gpm @ 3 psi (91 lpm @ 21 kpa).  
Rate:

Nozzle Count: Eight (8)

PRODUCT CODE 0010-7478  
GS Geyser

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall have an eight (8) hole spray pattern angled at 15 degrees from vertical. Tamper resistant winter caps are included.

Dimensions: Flush to grade mount.

Recommended FlowThe hydraulic requirements shall be 6 gpm @ 5 psi (23 lpm @ 34 kpa).  
Rate:

PRODUCT CODE 0010-7492  
GS Gusher

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 6.625 inches (168mm) with a wall thickness of 0.280 inches (7mm). The canister shall be 12 inches (305mm) tall with a .25 thick 8 inch X 4 inch (6mm X 203 X 101mm) base plate. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall have an eighteen (18) hole shower like spray pattern. Tamper resistant winter caps are included.

Dimensions: Flush to grade mount with an overall height of 60 inches (1524mm)

Recommended Flow The hydraulic requirements shall be 10 gpm @ 2.5 psi (38 lpm @ 17 kpa).  
Rate:

PRODUCT CODE 0010-7480  
GS Monster 5

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall have a five (5) hole spray pattern angled at 15 degrees from vertical. The hydraulic requirements shall be 32 gpm @ 15 psi (121 lpm @ 103.4 kpa). Tamper resistant winter caps are included. The water inlet shall be 1 inch (25mm) National Pipe Thread located 1.41 inches (35.8mm) below the base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 10 gpm @ 2 psi (38 lpm @ 14 kpa).  
Rate:

PRODUCT CODE 0010-7497  
GS Spray Tunnel 8

Characteristics The eight (8) spray canisters shall be connected to two (2) 58 inch (1473mm) base rails that works as a distribution manifold. The two (2) rails shall be bolted together inline with one another for a total length of 123 inches (3124mm). Each canister shall be no less than 6 inches (152mm) tall with a diameter of Ø2.88 inches (73mm). The Acetal spray nozzles and winter caps shall be seated into the canisters with a o-rings and secured using tamper resistant security bolts. Tamper resistant winter caps are included. All nozzles sit flush with final grade. There shall be two (2) 1.5 inch (38mm) National Pipe Thread water inlet located at the centre of each rail.

Dimensions: Flush to grade mount with an overall height of 8 inches (203) and length of 123 inches (3124mm)

Recommended Flow The hydraulic requirements shall be 30 gpm @ 4 psi (114 lpm @ 28 kpa).  
Rate:

Nozzle Count: Eight (8)

Water Display: Water will flow through eight (8) 2.5" acetal nozzles. If restriction is placed on any nozzle, the flow and height on the remaining nozzles will increase.

PRODUCT CODE 0010-7484  
GS Steady Stream

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The adjustable spray nozzle shall have one .1875 inch (4.75mm) hole that sprays at any direction by rotating the nozzle. Tamper resistant winter caps are included.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 1 gpm @ 3.5 psi (4 lpm @ 24 kpa).  
Rate:

PRODUCT CODE 0010-9816  
GS Team Effect

Characteristics The eight (8) spray canisters shall be connected to two (2) 54 inch (1371mm) base rails that work as a distribution manifolds. The two (2) rails shall be bolted together inline with one another for a total length of 123 inches (3124mm). Each canister shall be no less than 6 inches (152mm) tall with a diameter of Ø2.88 inches (73mm). The Acetal spray nozzles and winter caps shall be seated into the canister with an o-ring and secured using tamper resistant security bolts. Tamper resistant winter caps are included. All nozzles sit flush with final grade. There shall be one 1.5 inch (38mm) National Pipe Thread water inlet located in the center of each base rail, requiring a single supply line tee'd to each inlet.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 8 gpm @ 1 psi (30 lpm @ 7 kpa).  
Rate:

Nozzle Count: Eight (8)

Water Display: Water will flow through eight (8) 2.5" acetal nozzles. If restriction is placed on any nozzle, the flow and height on the remaining nozzles will increase.

PRODUCT CODE 0010-7486  
GS The Wave

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall have a seven (7) hole spray pattern angled at 30 degrees from vertical. Tamper resistant winter caps are included.

Dimensions: Flush to grade mount.

Recommended FlowThe hydraulic requirements shall be 3 gpm @ 3 psi (11 lpm @ 21 kpa).  
Rate:

PRODUCT CODE 0010-7489  
GS Tulip

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall provide a mushroom sheet spray effect. The hydraulic requirements shall be 10 gpm @ 15 psi (38 lpm @ 103.4 kpa). Tamper resistant winter caps are included. The water inlet shall be 1 inch (25mm) National Pipe Thread located 1.41 inches (35.8mm) below the base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 6 gpm @ 0.75 psi (23 lpm @ 5 kpa).  
Rate:

PRODUCT CODE 0010-7479  
GS Whale Whoosh

Characteristics Shall be constructed of schedule 40 stainless steel structural tubing with an outside diameter of 2.875 inches (73mm) with a wall thickness of 0.203 (5mm). The canister shall be a total height of 11.38 inches (289.05mm) tall with a .25 inch (6.35mm) thick X 5.5 inch diameter (139.7mm) base plate. The canister shall be secured into place by securing three (3) 3/8 inch x 11 inches (9.52 mm x 279mm) L bolts (SS) through three (3) anchor holes on the side of the canister. The Acetal spray nozzle and winter cap shall be seated into the canister with an o-ring and secured using a tamper resistant security bolt. The spray nozzle shall have two (2) slant jet holes that create a mist under pressure. Tamper resistant winter caps are included.

Dimensions: Flush to grade mount.

Recommended Flow The hydraulic requirements shall be 2 gpm @ 7 psi (8 lpm @ 48 kpa).  
Rate:

PRODUCT CODE 0011-1737  
PlayPHASE Base Large

Characteristics The playPHASE base Large shall be a fully welded assembly. A main body shall be constructed of 10 inch (DN250) stainless steel schedule 10 pipe. A mounting flange with rolled outer lip will be welded to the top of the pipe body, and a 0.5 inch (12.7mm) baseplate welded to the bottom. A 1.5 inch (40mm) F-NPT coupler shall be welded to the main body to supply water. Eight (8) 0.5 inch (12.7mm) threaded holes shall be drilled in the top flange for feature mounting. These holes are through holes, exiting into the main pipe body, ensuring zero leak paths. The top flange shall incorporate an outer lip to ensure the aluminum cover and/or feature flange is recessed and flush to grade. A Neoprene gasket and aluminum cover shall be included for winterization.

PRODUCT CODE      0011-1953  
PlayPHASE Base Medium

Characteristics      The playPHASE base Medium shall be a fully welded assembly. A main body shall be constructed of 8 inch (DN200) stainless steel schedule 10 pipe. A machined mounting flange will be welded to the top of the main body, and a 0.5 inch (12.7mm) thick stainless steel baseplate welded to the bottom. A 1.5 inch (40mm) F-NPT coupler shall be welded to the main body to supply water. Eight (8) 0.5 inch (12.7mm) threaded holes shall be drilled in the top flange for feature mounting. These holes are through holes, exiting into the main pipe body, ensuring zero leak paths. The top flange shall incorporate an outer lip to ensure the aluminum cover and/or feature flange is recessed and flush to grade. A Neoprene gasket and aluminum cover shall be included for winterization.

PRODUCT CODE 0011-2156  
PlayPHASE Base Small

Characteristics The playPHASE base Small shall be a fully welded assembly. A main body shall be constructed of 4 inch (DN100) stainless steel schedule 10 pipe. A machined mounting flange will be welded to the top of the main body, and a 0.5 inch (12.7mm) thick stainless steel baseplate welded to the bottom. A 1.5-inch (40mm) F-NPT coupler shall be welded to the main body to supply water. Eight (8) 0.5 inch (12.7mm) threaded holes shall be drilled in the top flange for feature mounting. The backside of these holes shall be capped with laser welded nut caps to ensure zero leak paths. The top flange shall incorporate an outer lip to ensure the aluminum cover and feature flange is recessed and flush to grade. A Neoprene gasket and aluminum cover shall be included for winterization.

### PART 3 – EXECUTION

#### 3.1 ACCEPTABLE INSTALLERS

1. Acceptable Installers:
  - a. Firm with minimum of 10 aquatic play pad installations and identified as a Preferred Installer by the manufacturer.
  - b. Pre-approved general contractor as identified by the owner
  - c. The installation shall be accomplished by skilled work personnel. The installation of all water pipe and fittings, and the installation of all electrical wiring and conduit, shall be under the direct full-time supervision of a licensed corresponding trade, as approved by the owner.

#### 3.2 PERFORMANCE

1. Verification of Conditions:
  - a. Examine all fixtures and components and verify that equipment is undamaged and ready for field assembly.
  - b. Return damaged and non-conforming products to the manufacturer.
  - c. Identify location of underground utility lines on surface.
2. Protection:
  - a. Protect adjacent facilities, plants, trees, ground covers, grass, paved surfaces, and other site improvements from damage during assembly and installation.

3. Layout and Excavation:

- a. Lay out aquatic play features, components and supply and drain lines within pool areas.

4. Excavation for Foundation:

- a. All excavation shall be cut accurately to required lines and dimensions for work on drawings, and shall be large enough to provide adequate clearance for the proper execution of the work within them.

5. Concrete Placement and Cast in Place Footings:

- a. Obtain approval from Owner's Representative prior to pouring concrete.

6. Inspection:

- a. When the excavation has been carried to the required depth as shown on the drawings, the Contractor shall do no more work until after the inspection by the Engineer, who shall order the foundation work to proceed, or further excavation as the conditions indicate, and no other work shall be done until the excavation has been approved by the Engineer.

7. Installation

- a. Aquatic play features shall be installed in accordance with the manufacturer's specification, and approved by the owner. The contractor shall use extreme care when installing aquatic play features.
- b. All wrappings are to be left intact through installation and then to be removed upon completion.
- c. Entire assemblies shall be installed in accurate location, square and plumb, and in required location to surrounding finished grade, on footings, as shown on the plans. Prior to park commissioning all features must be flushed with potable water and the water balanced should a water treatment system be part of the project
- d. An owner/operator training meeting must be conducted and documented prior to handoff of the project.

3.3 COMPLETION

1. Testing:

- a. All aquatic play feature lead lines shall be water pressure tested as directed by local codes and the manufacturer's recommendations before backfilling and pouring of concrete slabs. The contractor is to ensure all water supply lines are free of debris, and flushed of any foreign material, prior to the hook-up of any aquatic play features, and the contractor shall have inspected the entire system (including all electronic systems) in the presence of the Owners Representative. The contractor is to ensure all nozzles are adjusted and secured to the owner's satisfaction. The contractor is to test all drainage systems of the aquatic play features. Refer to the Installation manual for a full description of related tasks prior to completion.

PART 4 - CONTROLLER – POTABLE – GENERAL

4.1 SUMMARY

1. The installation shall be as indicated on construction and manufacturer's drawings, and in accordance with local codes/regulations, and the manufacturer's recommendation as reviewed and approved by the owner. The installation shall be accomplished by skilled work personnel.

#### 4.2 SCOPE

1. Engineering and local health authority approval are the responsibility of the owner and/or their representative.
2. Provision of Internet connector to the controller is the responsibility of the owner and/or their representative.

#### 4.3 REFERENCES – BASIS OF DESIGN

1. Waterplay Design and Installation Drawings.
3. Waterplay Operation & Maintenance Manual.
4. Waterplay Warranty Policy.

#### 4.4 QUALIFICATIONS OF MANUFACTURER

1. The manufacturer shall have a minimum 10 years' experience manufacturing spray park water treatment systems. An ISO 9001:2015 quality assurance program must be in place at the manufacturing facility.
2. A manufacturer-approved and experienced technician shall be used for commissioning and on-site system training.
3. The manufacturer shall provide post installation support.

#### 4.5 COMPLIANCES

1. The controller shall comply with:
  - a. Local regulations & codes, national and international standards, applicable health codes, and authorities having jurisdiction.
  - b. CSA or UL or ETL certification by an accredited third-party dependent upon jurisdiction. Where applicable, components shall have NSF International (NSF) 50 or equivalent approvals.

### PART 5 - PRODUCTS

#### 5.1 GENERAL

1. The manufacturer shall conduct a pre-shipping in-house test of the equipment to ensure a complete working system.

#### 5.2 WTS CONTROLLER

1. The Park Controller shall operate on a real time clock and will control operation of the park's valves based on time of day and day of the week.
2. The Park Controller shall be capable of remote access to the PLC program, system variables, and the Human Machine Interface (HMI) touchscreen. The Controller must be configured to interface with a supervisory control system, such as smartACCESS, or approved alternative
3. The controller shall have a colour Human Machine Interface (HMI) touchscreen through which operators can modify park sequencing, component run times, operating days, hours of daily operation, and test mode to manually activate all valves.

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4. The controller shall operate the 24VAC solenoid valves on the park manifold.
5. The controller includes power distribution to all necessary components, including the park manifold valves and activators.
6. The controller shall have a minimum of one input channel available to connect to each park activator.
7. The controller will actuate park valves as per an operator programmable, manufacturer preset, and drought control sequence upon input signal from an activator.
8. The controller shall be prewired and have all inputs and outputs channels tested prior to shipping.
9. The WTS controller shall be housed in a NEMA 4 enclosure.

## 5.2 MANIFOLD 4"

1. The manifold shall have a 4" schedule 10 stainless steel header, pressure gauge and ½ inch (12 mm) hose bibb.
2. The manifold shall have schedule 80 PVC true union ball valves plumbed off each independent leg of the header and connected to Rainbird PGA 100 series solenoid valves with 1.5" (38mm) schedule 80 PVC unions on each outlet supply to components.
3. Each valve leg shall be independently removable without shutting down manifold flow to allow for servicing of solenoid valves during operational hours.
4. A solenoid valve NEMA 4 wire junction box mounted to the manifold structure.
5. The manifold shall be connected to a butterfly valve for shut off and servicing.

## PART 6 - EXECUTION

### 6.1 INSPECTION

1. Upon equipment delivery, the Contractor shall indicate any damaged or missing items on the shipping documents. If further inspection is required, the Contractor shall indicate further inspection to follow on the shipping documents.
2. Upon equipment delivery, the Contractor shall inspect the shipment and report any damaged or missing items to the manufacturer and to the shipping company within 48 hours of receipt.

END OF SECTION

## SECTION 131214 – SPRAY PAD PIPING

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Piping
- B. Valves
- C. Installation

### PART 2 - MATERIALS

#### 2.1 PIPING

- A. Pipe and fittings shall be Schedule 80, PVC, ASTM D 1785, NSF approved for potable water.
- B. All joints shall be cemented.

#### 2.2 VALVES

- A. 2" inch diameter and smaller: PVC true union ball valves with PTFE seats and EPDM seals.
- B. 3 inch diameter and larger: Flanged PVC body gate valves with polypropylene disc, stainless steel shaft, EPDM seals and lever lock handles.
- C. Extension tees are to be provided for valves located in vaults and pits.
- D. Check valves shall be wafer-type w/ metal hinge design. Body to be cast iron ASTM A-126 Grade B. Disc to be aluminum bronze ASTM B148 alloy 952. Shaft pin, spring and pin stop to be stainless steel.
- E. Approved manufacturers:
  - 1. Hayward
  - 2. Sloane
  - 3. Approved equal.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Piping locations shown on plans are schematic and precise locations shall be determined by actual field conditions by the Contractor and submitted to Architect for review.
- B. Contractor to provide all joints, valves, fittings, etc. required for a complete installation.

#### 3.1 PIPING AND PIPE FITTINGS - HANGERS AND SUPPORTS

- A. Work included: Pipe, fittings, connections, wall penetrations, hangers and supports, equipment bases and supports, excavation and backfill.
- B. REFERENCES

1. ANSI/ASTM D2564 - Solvent weld cements for polyvinyl chloride (PVC) plastic piping and fittings.
2. ANSI/ASTM D1785 - Standard specification for Polyvinyl chloride (PVC) plastic pipe schedules 40, 80 and 120, NSF seal for potable water.
3. ASTM B88 - Seamless copper water tube.
4. ASTM D2855 - Practice for making solvent cemented joints with PVC pipe and fittings.
5. Eslon Engineering Manual for plastic piping systems.

C. PLACEMENT AND USE

1. Use the prescribed pipe type in the following areas. All plastic pipe flanges shall be schedule 80 PVC with neoprene gaskets where required.
2. All pool gutter lines shall be schedule 80 solvent welded, conforming to ASTM D1785/76. All gutter lines shall drain by gravity to the surge tank.
3. All buried return lines shall drain by gravity to the surge tank.
4. All buried filter return lines, main drain lines, PVC schedule 80 solvent weld.
5. All chemical piping, schedule 80 PVC, solvent weld.
6. Piping must be laid so it will drain completely by gravity. In all instances where gravity drainage is not provided, the contractor shall install drain valves so the lines can be drained completely. Shop drawing will be required on any such installation.
7. Cut all pipe with a mechanical cutter without damaging the pipe.
8. Placing and laying pipe: Inspect pipe for defects before installation. Clean the interior of the pipe thoroughly of foreign matter and keep clean during laying operation. Pipe shall not be laid in water or when trench conditions are unstable. Water shall be kept out of the trench until the pipe is installed. When work is not in progress, open ends of the pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or the fittings.
9. Threaded Joints: After cutting and before threading, the pipe shall be reamed and shall have burrs removed. Screw joints shall be made with graphite or inert filler and oil or with an approved graphite compound applied to the male threads only. Threads shall be full cut and not more than 3 threads shall remain exposed. Use Teflon II tape on the male threads of all threaded pipe joints. Unions shall be provided where required for disconnection of exposed piping. Unions shall be permitted only where access is provided.
10. Solvent welded joints shall be made in accordance with the manufacturer's printed instructions.
11. Make provisions for expansion and contraction by way of swing joints or snaking.
12. Protect piping from exposure to aromatic hydrocarbons, halogenated hydrocarbons and most esters and keytones that attack the material.
13. Protect all pipe from mechanical damage and long exposure to sunlight during storage.
14. PVC welding is not allowed.
15. Flanged Joints are not allowed on buried pipes.

D. HANGERS AND SUPPORTS

1. All mechanical room piping must be properly supported.

2. It shall be the contractor's responsibility to properly support piping at all valves, pumps, equipment, overhead areas, etc.
3. Use proper hanger for conditions is essential. All piping must be supported laterally as well as vertically hung.

E. PIPE IDENTIFICATION

1. Provide identification on all piping located in the filter room.
2. Identify the contents of the pipe and direction of flow.
3. Mark at least once on each five foot intervals minimum. Consult Health Department Code for minimum marking requirements. If none required follow industry practice.
4. Color code per Health Department requirements. If code does not identify color coding requirements, consult Architect / Engineer.
5. Brady, B-946, custom legend, self-sticking markers and arrows or equal.

3.2 EQUIPMENT BASES AND SUPPORTS

- A. Provide for major equipment reinforced concrete housekeeping bases poured directly on structural floor slabs. Housekeeping pads shall be a minimum of four inches thick and extend a minimum of four inches beyond the machinery base plate. Provide templates, anchor bots, rubber vibration isolators and accessories required for mounting and anchoring the equipment. Consult with the equipment manufacturer for length and installation of the anchor bolts.

3.4 SLEEVES AND WALL PENETRATIONS

- A. Pipes penetrating all water tight walls shall use "Link Seal" Century line sleeves in combination with link seals having stainless steel service designation. Patch exterior side of wall penetrations with non-shrink grout.
- B. Provide shop drawings on proposed location of all pipes penetrating water tight walls.

3.5 Contractor shall mount in the filter room a laminated sheet showing the location of all valves and piping. All valves shall be numbered corresponding to valve tags supplied by contractor. The drawings shall include instruction for winterizing the pool with drain points clearly identified.

3.6 Contractor shall mount in the filter room a laminated sign showing how to backwash the filter. All valves shall be numbered corresponding to valve tags supplied by contractor.

END OF SECTION



## SECTION 22 0500 - COMMON WORK RESULTS FOR PLUMBING

### PART 1 - GENERAL

#### 1.1 SECTION REQUIREMENTS

- A. Summary: General requirements for motors, hangers and supports, vibration isolation, and meters and gages.
- B. Submittals: Product Data for materials and equipment specified in this Section.

### PART 2 - PRODUCTS

#### 2.1 HANGERS AND SUPPORTS

- C. Hanger and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.
- D. Building Attachments: Powder-actuated-type, drive-pin attachments with pullout and shear capacities appropriate for supported loads and building materials.
- E. Mechanical-Expansion Anchors: Insert wedge-type attachments with pullout and shear capacities appropriate for supported loads and building materials.

#### 2.2 VIBRATION ISOLATION

##### A. Vibration Supports:

1. Pads: Arranged in single or multiple layers of oil- and water-resistant neoprene, rubber, or hermetically sealed compressed fiberglass of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
2. Mounts: Double-deflection type, with molded, oil-resistant fiberglass, rubber or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and baseplate for bolting to structure. Provide isolator with minimum 0.5-inch static deflection.
3. Spring Isolators: Freestanding, laterally stable, restrained or open-spring isolators. Provide isolator with minimum 1-inch static deflection.

##### B. Vibration Hangers

1. Elastomeric Hangers: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements bonded to steel housings with threaded connections for hanger rods. Provide isolator with minimum 0.5-inch static deflection.
2. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression. Provide isolator with minimum 1-inch static deflection.

### PART 3 - EXECUTION

#### 3.1 GENERAL PIPING INSTALLATIONS

- B. Install piping free of sags and bends.
- C. Install fittings for changes in direction and branch connections.
- D. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, and concrete floor and roof slabs.
- E. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast-iron pipes for wall sleeves.
- F. Comply with requirements in Division 07 Section "Penetration Firestopping" for sealing pipe penetrations in fire-rated construction.
- G. Install unions at final connection to each piece of equipment.
- H. Install dielectric unions and flanges to connect piping materials of dissimilar metals in gas piping.
- I. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in water piping.

#### 3.2 GENERAL EQUIPMENT INSTALLATIONS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components, unless otherwise indicated.
- J. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- K. Install equipment to allow right of way for piping installed at required slope.

#### 3.3 HANGERS AND SUPPORTS

- A. Comply with MSS SP-69 and MSS SP-89. Install building attachments within concrete or to structural steel.
- B. Install hangers and supports to allow controlled thermal and seismic movement of piping systems.
- L. Install powder-actuated drive-pin fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.
- M. Install mechanical-expansion anchors in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.

- N. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- O. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
  - 1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
  - 2. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
  - 3. Adjustable Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
  - 4. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
  - 5. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2.
- P. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:
  - 1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
  - 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.

### **3.4 VIBRATION ISOLATION**

- A. Adjust vibration isolators to allow free movement of equipment limited by restraints.
- B. Install resilient bolt isolation washers and bushings on equipment anchor bolts.
- C. Install cables so they do not bend across sharp edges of adjacent equipment or building structure.

END OF SECTION 22 0500



## SECTION 22 0517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Sleeves.
  - 2. Sleeve-seal systems.
  - 3. [Fire-resistance-rated, watertight ] [Watertight ]sleeve-seal systems.
  - 4. Grout.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

### PART 2 - PRODUCTS

#### 2.1 SLEEVES

- A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.
- D. Cast-in-place watertight device for protecting penetrating objects from expansion and contraction of concrete. Factory-assembled for use in cast-in-place concrete floors and walls and consisting of two outer sleeves and a one-piece radial extended-flange waterstop gasket, with mid-body seal for embedment and sealing to concrete slab and continuous water seal extending to the penetrating pipe.
- E. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- F. Galvanized-Steel-Sheet Sleeves: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.

#### 2.2 SLEEVE-SEAL 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. Advance Products & Systems, Inc.
  2. CALPICO, Inc.
  3. Metraflex Company (The).
  4. Pipeline Seal and Insulator, Inc.
  5. Proco Products, Inc.
- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
  2. Pressure Plates: Stainless steel.
  3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

### 2.3 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide [1-inch (25-mm)] <Insert dimension> annular clear space between piping and concrete slabs and walls.
  1. When cast-in-place watertight sleeve seals are required, select sleeve size to match the size and type of pipe to be installed.
  2. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
  1. Cut sleeves to length for mounting flush with both surfaces.

- a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas [2 inches (50 mm)] <Insert dimension> above finished floor level.
  2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
1. Cut sleeves to length for mounting flush with both surfaces.
  2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
  3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 07 Section "Joint Sealants."
- E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Division 07 Section "Penetration Firestopping."

### 3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

### 3.3 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and seals for the following piping-penetration applications:
  1. Exterior Concrete Walls above Grade:
    - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
    - b. Piping NPS 6 and larger: Galvanized-steel-pipe sleeves.
  2. Exterior Concrete Walls below Grade:
    - a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
    - b. Piping NPS 6 and larger: Galvanized-steel-pipe sleeves.
  3. Concrete Slabs-on-Grade:

- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
  - b. Piping NPS 6 and larger: Galvanized-steel-pipe sleeves.
4. Concrete Slabs above Grade:
- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
  - b. Piping NPS 6 and larger: Galvanized-steel-pipe sleeves.
5. Interior Partitions:
- a. Piping Smaller Than NPS 6: Galvanized-steel-pipe sleeves.
  - b. Piping NPS 6 and larger: Galvanized-steel-pipe sleeves.

END OF SECTION 22 0517

## SECTION 22 0519 - METERS AND GAGES FOR PLUMBING PIPING

### 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. Meters and gages

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

#### 1.4 SUBMITTALS

- A. Not used.

#### 1.5 QUALITY ASSURANCE

- A. Not used.

### PART 2 - PRODUCTS

#### 2.1 METERS AND GAGES

- A. Temperature and indicator ranges for services required. Accuracy of thermometers shall be  $\pm$  1%.
  1. Mercury In-Glass Thermometers: Die-cast, aluminum finished, glass front, mercury filled tube with magnifying lens.
  2. Direct-Mount Filled-System Dial Thermometers: Vapor actuated, universal angle, drawn steel or cast aluminum case with glass lens.
  3. Remote Reading Filled-System Dial Thermometers: Vapor actuated, universal angle, drawn steel or cast aluminum case with glass lens.
  4. Bimetal Dial Thermometers: Direct mounted, bimetal, universal angle type with stainless steel case and glass lens.
  5. Dial-Type Insertion Thermometers: Bimetal, stainless steel case and stem.
  6. Thermometers Wells: Brass or stainless steel, pressure rated to match piping system design pressure.

7. Pressure Gages: General use, ASME B4Q.1, Grade A, phosphor-bronze, Bourdon-tube type, drawn steel or brass case, glass lens.
8. Pressure Gage Accessories: Brass tubing straight coil siphon; brass snubber with disc suitable for fluid served and rated pressure.
9. Flow meters to be noninvasive ultrasound type.
10. BTU Meters: Turbine wheel flow meter, temperature sensors, calculator with integral battery pack, bronze housing,  $\pm 1\%$  accuracy.
11. Test Plugs: Nickel plated brass body, self-sealing valve type core inserts.

### PART 3 - EXECUTION

#### 3.1 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 22 0519

## SECTION 22 0523 – GENERAL DUTY VALVES FOR PLUMBING PIPING

### 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 the following Valves:
  - 1. Gate valves.
  - 2. Ball valves.
  - 3. Plug valves.
  - 4. Butterfly valves
  - 5. Swing check valves.
  - 6. Wafer check valves.
  - 7. Lift check valves.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

#### 1.4 SUBMITTALS

- A. Not used.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
  - 1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
  - 2. ASME B31.1 for power piping valves.
  - 3. ASME B31.9 for building services piping valves.

### PART 2 - PRODUCTS

#### 2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to HVAC valve schedule articles for applications of valves.
- B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.

## 2.2 VALVES

- A. General duty valves in cast iron, bronze and brass, fabricated to comply with Manufacturer's Standardization Society ( MSS ) classification listed. Gate, globe, ball, butterfly and plug valves for shutoff duty; globe, ball and plug valves for throttling duty.
  - 1. Gate valves, 2-inch and smaller, for Chilled Water, Domestic Hot and Cold Water service: MSS SP-80, Class 125 or Class 150, cast bronze, threaded or soldered ends, based upon service requirements.
  - 2. Gate valves, 2-inch and smaller, for Heating Hot Water, Steam service: MSS SP-80, Class 150, cast bronze, threaded or soldered ends, based upon service requirements.
  - 3. Gate valves, 2 1/2-inch and larger: MSS SP-70, Class 125, iron body, flanged ends.
  - 4. Ball valves, 1-inch and smaller: Rated for 150 psi saturated steam service, 400 psi water-oil-gas ( WOG ) service, 2-piece construction, bronze body, threaded or soldered ends, based upon service requirements.
  - 5. Ball valves, 1 1/4-inch to 2-inch: Rated for 150 psi saturated steam service, 400 psi WOG, 3-piece construction, bronze body, threaded or soldered ends, based upon service requirements.
  - 6. Plug valves, 2-inch and smaller: Rated at 150 psi WOG, bronze body, threaded ends.
  - 7. Plug valves, 2 1/2-inch and larger: MSS SP-78, rated at 175 psi WOG, semi-steel body, flanged ends.
  - 8. Globe valves, 2-inch and smaller: MSS SP-80, Class 125 or Class 150, cast bronze.
  - 9. Globe valves, 2 1/2-inch and larger: MSS SP-85, Class 125, iron body.
  - 10. Butterfly valves, 2 1/2-inch and larger: MSS SP-67, rated at 200 psi, cast iron body, field replaceable sleeve, stainless steel stem, lug or wafer type, based upon service requirements.
  - 11. Swing check valves, 2-inch and smaller: MSS SP-80, Class 125 or Class 150, cast iron body and cap, threaded or soldered ends, based upon service requirements.
  - 12. Swing check valves, 2 1/2-inch and larger: MSS SP-71, Class 125, cast iron body and cap, flanged ends.
  - 13. Wafer check valves: Class 250, cast iron body, to open with one foot differential pressure.
  - 14. Lift check valves, 2-inch and smaller: Class 125, cast bronze body and cap, threaded ends.
  - 15. Gate valves, 2-inch and smaller: Used for general shutoff application on all High Temperature Hot Water systems shall be Class 600 psi, ASTM A-216-WCB steel body and bonnet, with 600 psi socket weld ends, solid disc, copper-silicon alloy stem, brass packing gland, Teflon® impregnated packing, and malleable iron handwheel. Provide Class 600 psi valves meeting the above specifications where system operating pressure and test pressures allow.
  - 16. Gate valves, 65-mm and larger: Used for shutoff application on all High Temperature Hot Water systems shall be Class 600, ASTM A-216-WCB steel body, mounted, with body and bonnet conforming to ASTM A-216-WCB with flanged ends, Teflon®

impregnated packing and two piece backing gland assembly, with mose ends, flex wedge, inside screw, rising stem and provided cap and chain. Grease fittings shall be supplied for shaft packing.

17. Ball valves, 1–inch and smaller: Class 600 psi, two piece construction, with steel body conforming to ASTM B62, conventional port, chrome plated brass ball , replaceable Teflon® or TFE seats and seals, blowout–proof stem and vinyl covered steel handle. Provide solder ends for hot water service. Provide socket weld ends on medium and high pressure steam and condensate service valves.
18. Ball valves, for hot water service, to 6–inches: Class 600 psi, three piece construction, with steel body conforming to ASTM B62, conventional port, chrome plated brass ball , replaceable Teflon® or TFE seats and seals, blowout–proof stem and vinyl covered steel handle. Provide socket weld ends for high temperature hot water service. Ball seats and stem must be easily replaced without removing valve pipe connections from line. Leakproof at all pressures up to 600 psi. Construction of valve shall allow for actuator, if needed. Valve stem shall be blowout proof.

### PART 3 - EXECUTION

#### 3.1 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 22 0523



## SECTION 22 1113 FACILITY WATER DISTRIBUTION PIPING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section specifies the water distribution piping system, including potable cold, hot and re-circulated hot water piping, fittings, and specialties within the building.

#### 1.2 REFERENCE DOCUMENTS

- A. ASTM F 2389-06 - Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems
- B. CSA B137.11 - Polypropylene (PP-R) Pipe and Fittings for Pressure Applications
- C. NSF/ANSI 14 - Plastic Piping System Components and Related Materials
- D. NSF/ANSI 61 - Drinking Water Systems Components - Health Effects

#### 1.3 DEFINITIONS

- A. Definitions shall be in accordance with local plumbing codes and ASTM F 2389.

#### 1.4 SUBMITTALS

- A. Material list naming each product to be used identified by manufacturer and product number, in accordance with Section 01 30 00.

#### 1.5 QUALITY ASSURANCE

- A. Material shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.
- B. Material shall comply with manufacturers specifications.
- C. Special Engineered products shall be certified by NSF International as complying with NSF 14.

### PART 2 - PRODUCTS

#### 2.1 PIPE AND PIPING PRODUCTS

- A. Pipe shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The pipe shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipe shall comply with the rated pressure requirements of ASTM F 2389. All pipe shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.

- B. Pipe shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Piping specifications and ordering information are available at [www.gpi-us.com](http://www.gpi-us.com).

## 2.2 FITTINGS

- A. Fittings shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The fittings shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All fittings shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.
- B. Fittings shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Fittings specifications and ordering information are available at [www.gpi-us.com](http://www.gpi-us.com).

## 2.3 VALVES

- A. Valves with PP-R bodies shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The valves shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.
- B. Valves with brass bodies shall be manufactured in accordance with the manufacturers specifications and shall be certified by NSF International as complying with NSF 61.
- C. Valves shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Valve specifications and ordering information are available at [www.gpi-us.com](http://www.gpi-us.com).

## PART 3 - EXECUTION

### 3.1 PIPING APPLICATIONS

- A. Install listed pipe materials and joining methods below in the following applications:
  - 1. Underground, Service Entrance Piping: Polypropylene (PP-R) piping in SDR 7.4 or heavier.
  - 2. Aboveground: Polypropylene (PP-R) piping in SDR 6, 7.4 or 11 based on the required minimum pressure rating and use temperature.

### 3.2 FUSION WELDING OF JOINTS

- A. Install fittings and joints using socket-fusion, electrofusion, or butt-fusion as applicable for the fitting type. All fusion-well joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.

- B. Fusion-weld tooling, welding machines, and electrofusion devices shall be as specified by the pipe and fittings manufacturer.
- C. Prior to joining, the pipe and fittings shall be prepared in accordance with F 2389 and the manufacturer's specifications.
- D. Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications.

### 3.3 VALVE APPLICATIONS

- A. Install gate valves close to main on each branch and riser serving 2 or more plumbing fixtures or equipment connections and where indicated.
- B. Install gate or ball valves on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.
- C. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.
- D. Install swing check valve on discharge side of each pump and elsewhere as indicated.
- E. Install ball valves in each hot-water circulating loop and discharge side of each pump.

### 3.4 PIPING INSTALLATIONS

- A. Install hangers and supports at intervals specified in the applicable Plumbing Code and as recommended by pipe manufacturer.
- B. Support vertical piping at each floor and as specified in the applicable Plumbing Code.

### 3.5 INSPECTING AND CLEANING

- A. Inspect and test piping systems following procedures of authorities having jurisdiction and as specified by the piping system manufacturer.
- B. Clean and disinfect water distribution piping following procedures of the authority having jurisdiction.

END OF SECTION 22 1113



## SECTION 22 1116 - DOMESTIC WATER PIPING

### 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 water distribution piping from locations indicated to fixtures and equipment inside building.
- B. Related Sections include the following:
  - 1. Division 2 Section "Water Systems" for exterior water service piping.
  - 2. Division 2 Section "Water Systems" for exterior water service piping and water meters.
  - 3. Division 22 for water meters, thermometers, pressure gages, fittings, thermometers, pressure gages, and fittings, and water distribution piping specialties.

#### 1.3 DEFINITIONS

- A. Water Service Piping: Water piping outside building that conveys water to building.
- B. Service Entrance Piping: Water piping at entry into building between water service piping and water distribution piping.
- C. Water Distribution Piping: Water piping inside building that conveys water to fixtures and equipment throughout the building.
- D. The following are industry abbreviations for plastic piping materials:
  - 1. CPVC: Chlorinated polyvinyl chloride.
  - 2. NP: Nylon.
  - 3. PB: Polybutylene.
  - 4. PE: Polyethylene.
  - 5. PP: Polypropylene.
  - 6. PVC: Polyvinyl chloride.

#### 1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:
  - 1. Combined Fire-Protection and Domestic, Service Entrance Piping: 250 psig (1725 kPa).
  - 2. Service Entrance Piping: 160 psig (1100 kPa).
  - 3. Water Distribution Piping: 125 psig (860 kPa).

## 1.5 SUBMITTALS

- A. Water Samples, Test Results, and Reports: Specified in "Field Quality Control" and "Cleaning" articles.

## 1.6 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.
- B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water piping components. Include marking "NSF-pw" on plastic potable-water piping.
- D. Comply with NSF 61, "Drinking Water System Components--Health Effects," Sections 1 through 9 for potable-water piping and components.

## PART 2 - PRODUCTS

### 2.1 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. Hard Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

### 2.2 PIPE AND TUBE FITTINGS

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper.
- C. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.
- D. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Include threads conforming to ASME B1.20.1 on threaded ends.
- E. PEX, PEX-A tubing with ASTM F1960 Fittings

### 2.3 JOINING MATERIALS

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.
- B. Refer to Division 22 Section "Common Results for Plumbing" for commonly used joining materials.
- C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.
- D. Copper, Keyed Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, gasket suitable for hot water, and bolts and nuts.

### PART 3 - EXECUTION

#### 3.1 EXCAVATION

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

#### 3.2 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Fitting Option: Mechanically formed tee-branch outlets and brazed joints may be used on aboveground copper tubing.
- D. Underground, Service Entrance Piping: Do not use flanges or valves underground. Use the following:
  - 1. 2-Inch and Smaller: ASTM B 88, Soft copper tube, Type K soft drawn copper, solder-joint pressure fittings; and soldered joints, HDPE (where allowed by local utility).
  - 2. 2-1/2 and 3": ASTM B 88, Type K hard drawn copper, solder-joint pressure fittings; and soldered joints, HDPE (Where allowed by local utility).
  - 3. 4" and Larger: AWWA C900, PVC pipe, ASTM F477 gaskets, ASTM D3139 joints, Pressure Class 165 psi (DR 25)
- E. Aboveground, Water Distribution Piping: Use the following:
  - 1. 2" and Smaller: ASTM B 88, Type L, water tube, drawn copper, solder-joint pressure fittings; and soldered joints, PEX-A tubing with ASTM F1960 Fittings.
  - 2. 2-1/2- and Larger: ASTM B 88, Type L, water tube, drawn copper, solder-joint pressure fittings; and soldered joints, PEX-A Tubing, with ASTM F1960 fittings.

- F. Underground, Water Distribution Piping: Do not use flanges or valves underground. Use the following:
1. 2-Inch and Smaller: ASTM B 88, Soft copper tube, Type K soft drawn copper tubing with 125 psi wrought copper sweat fittings soldered with silver solder, PEX-A Tubing, with ASTM F1960 fittings.
  2. Water piping below grade (trap primer supply) - Shall be type 'K' soft drawn copper continuous tubing PEX-A continuous tubing.
  3. 2-1/2- and larger: ASTM B 88, Type K hard drawn copper, solder-joint pressure fittings; and soldered joints, PEX-A Tubing, with ASTM F1960 fittings.

### 3.4 PIPE TRENCHES

- A. Top of largest pipe shall be a minimum of 16" below finished floor. Provide a 4" clean sand bed, tamped in place, for piping to lay on. Provide a minimum of 2" spacing between adjacent pipes and 4" to the sides of trench. Backfill over all piping in trench with clean sand providing 4-6" of compacted sand above top of largest pipe. Backfill remaining trench, evenly and continuously, with uniformed layers of suitable gravel aggregate.

### 3.4 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
1. Shutoff Duty: Use ball valves.
  2. Throttling Duty: Use ball valves.

### 3.5 PIPING INSTALLATION, GENERAL

- A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping installation.

### 3.6 SERVICE ENTRANCE PIPING INSTALLATION

- A. Extend service entrance piping to exterior water service piping in sizes and locations indicated for service entrances into building.
- B. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each service entrance pipe.
- C. Install water-pressure regulators downstream from shutoff valves.
- D. Ductile-Iron, Service Entrance Piping: Comply with AWWA C600. Install buried piping between shutoff valve and connection to water service piping with restrained joints. Anchor pipe to wall or floor at entrance. Include thrust-block supports at vertical and horizontal offsets.

1. Encase piping with polyethylene film according to ASTM A 674 or AWWA C105.
- E. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for sleeves and mechanical sleeve seals.

### 3.7 WATER DISTRIBUTION PIPING INSTALLATION

- A. Install piping level without pitch.
- B. Fitting Option for Hard Copper Tube: Mechanically formed tee-branch outlets may be used instead of tee fittings.

### 3.8 JOINT CONSTRUCTION

- A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping joint construction.
- B. Mechanically Formed Outlets: Form tee in copper tube according to equipment manufacturer's written instructions. Use tool designed for copper tube, drill pilot hole, form collar for outlet, dimple tube forming seating stop, and braze branch tube into collar.
- C. Grooved Joints: Assemble joints with coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- D. Solvent-Cemented, Thermoplastic Pipe and Fitting Joints: Handle cleaners, primers, and solvent cements according to ASTM F 402.

### 3.9 VALVE INSTALLATION

- A. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.
- B. Shutoff Valves: Install shutoff valve on each water supply to equipment, on each supply to plumbing fixtures without supply stops, and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.
- C. Drain Valves: Install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
  1. Install hose-end drain valves at low points in water mains, risers, and branches.
  2. Install stop-and-waste drain valves where indicated.
- D. Balancing Valves: Install in each hot-water circulation return branch, discharge side of each pump and circulator, and where indicated. Use ball valve for piping 2-inch NPS (DN50) and smaller.

- E. Calibrated Balancing Valves: Install in each hot-water circulation return branch, discharge side of each pump and circulator, and where indicated.

### 3.10 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices. Install the following:
  - 1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.
  - 2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.
  - 3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs longer than 100 feet (30 m).
  - 4. Spring cushion rolls, MSS Type 49, if indicated, for individual, straight, horizontal runs longer than 100 feet (30 m).
  - 5. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs 100 feet (30 m) or longer. Support pipe rolls on trapeze.
  - 6. Spring hangers, MSS Type 52, for supporting base of vertical runs.
- B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- E. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:
  - 1. 3/4-Inch NPS (DN20) and Smaller: Maximum horizontal spacing, 60 inches (1500 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
  - 2. 1-Inch NPS (DN25): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
  - 3. 1-1/4-Inch NPS (DN32): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
  - 4. 1-1/2 and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 96 inches (2400 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

### 3.11 CONNECTIONS

- A. Connect service entrance piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.
- B. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:

1. Booster Systems: Connect cold-water suction and discharge piping.
2. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
3. Plumbing Fixtures: Connect hot- and cold-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."
4. Equipment: Connect hot- and cold-water supply piping as indicated. Provide shutoff valve and union for each connection.

### 3.12 FIELD QUALITY CONTROL

#### A. Inspect service entrance piping and water distribution piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
  - a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  - b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

#### B. Test service entrance piping and water distribution piping as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
3. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
5. Prepare reports for tests and required corrective action.

### 3.13 CLEANING

- A. Clean and disinfect service entrance piping and water distribution piping as follows:
  - 1. Purge new piping and parts of existing water piping that have been altered, extended, or repaired before using.
  - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, procedure described in either AWWA C651 or AWWA C652 or as described below:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Fill and isolate system according to either of the following:
      - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
    - c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.
    - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.
- D. Prepare and submit reports for purging and disinfecting activities.
- E. Clean interior of piping system. Remove dirt and debris as work progresses.

### 3.14 COMMISSIONING

- A. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.
- B. Perform the following steps before putting into operation:
  - 1. Close drain valves, hydrants, and hose bibbs.
  - 2. Open shutoff valves to fully open position.
  - 3. Open throttling valves to proper setting.
  - 4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
  - 5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
  - 6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and that cartridges are clean and ready for use.
- C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.
- D. Check plumbing specialties and verify proper settings, adjustments, and operation.

1. Water-Pressure Regulators: Set outlet pressure at 80 psig (550 kPa) maximum, unless otherwise indicated.
- E. Energize pumps and verify proper operation.

END OF SECTION 22 1116



## SECTION 22 1119 - DOMESTIC WATER PIPING SPECIALTIES

### 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 domestic water piping specialties:
  - 1. Water meters..
  - 2. Backflow preventers.
  - 3. Water pressure regulators.
  - 4. Thermostatic water mixing valves.
  - 5. Water tempering valves.
  - 6. Miscellaneous piping specialties.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

#### 1.4 SUBMITTALS

- A. Not used.

#### 1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. NSF Compliance:
  - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
  - 2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9.

### PART 2 - PRODUCTS

#### 2.1 BACKFLOW PREVENTERS

- A. American Society of Safety Engineers ( ASSE ) Standard backflow preventers for flow rate and maximum pressure loss required, 150 psig minimum working pressure.

2.2 WATER PRESSURE REGULATORS

- A. ASSE 1003, initial working pressure 150 psig, minimum.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 22 1119

## SECTION 22 13 13 - FACILITY SANITARY SEWERS

### PART 1 - GENERAL

#### 0.1 SUMMARY

- A. This Section includes gravity-flow, nonpressure sanitary sewerage outside the building, with the following components:
  - 1. Cleanouts.
  - 2. Precast Concrete Manholes

#### 0.2 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: 10-foot head of water.
- B. Force-Main, Pressure-Piping Pressure Rating: At least equal to system operating pressure but not less than 200 psig.

#### 0.3 SUBMITTALS

- A. Coordination Drawings: Show pipe sizes, locations, and elevations.
- B. Shop Drawings: For manholes and vaults. Include plans, elevations, sections, details and frames and covers.
- C. Field quality-control test reports.
- D. Product Data: For the following:
  - 1. Cleanouts.
  - 2. Pipe material.

#### 0.4 PROJECT CONDITIONS

- A. Site Information: Research public utility records and verify existing utility locations prior to ordering any materials. Notify the Designer immediately if any discrepancies are found in the project survey.

## PART 2 - PRODUCTS

### 0.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 0.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

### 0.3 PVC, PRESSURE SEWER PIPE AND FITTINGS

- A. PVC Pipe and Fittings: According to one of the following:
  - 1. Class 200 rigid PVC Class 12454-B, conforming to ASTM D-1784 and ASTM D-2241 or ASTM D-1785 and ASTM D-2241
  - 2. C900 with a minimum DR 18
- B. Class 200 PVC shall be wrapped four times per 20-foot section with detection tape.
- C. Joints:
  - 1. Rubber gasketed joints shall conform to ASTM F-477
  - 2. Solvent welded joints shall conform to ASTM D-2466 and ASTM D-2467

### 0.4 PVC, GRAVITY SEWER PIPE AND FITTINGS

- A. PVC Sewer Pipe and Fittings: According to the following:
  - 1. PVC Sewer Pipe and Fittings, NPS 4 to NPS 15: ASTM D 3034, SDR 35, gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.

### 0.5 NONPRESSURE-TYPE PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
2. For Dissimilar Pipes: ASTM D 5926, PVC, or other material compatible with pipe materials being joined.

0.6 CLEANOUTS

PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

0.7 MANHOLES

- A. Standard Precast Concrete Manholes: ASTM C 478 precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
1. Diameter: 48 inches minimum, unless otherwise indicated.
  2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation if site conditions warrant and/or as shown in the plans.
  3. Base Section: 6-inch minimum thickness for floor slab and 5-inch (125-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  4. Riser Sections: 5-inch minimum thickness, and of length to provide depth indicated.
  5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  6. Gaskets: ASTM C 443, rubber.
  7. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
  8. Steps: Individual FRP steps wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12-inch intervals.
  9. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and diameter matching manhole frame and cover. Include sealant recommended by ring manufacturer.
  10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover.
  11. Manhole Frames and Covers: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch-minimum width flange and 26-inch (660-mm) diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."
    - a. Material: ASTM A 536, Grade 60-40-18 ductile iron, designed for heavy duty service, unless otherwise indicated.

## 0.8 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:
  - 1. Cement: ASTM C 150, Type II.
  - 2. Fine Aggregate: ASTM C 33, sand.
  - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
  - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: 5 percent through manhole.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: 8 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

## PART 3 - EXECUTION

### 0.1 PIPING INSTALLATION

- A. Excavating, trenching, and backfilling are specified in Section 312000.

- B. Identification: Materials and their installation are specified in Section 312000. Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
1. Use detectable warning tape over all piping and over edges of underground structures.
  2. Locate the ends of all side sewers with a 2 by 4 wooden stake four (4) feet long buried in the ground a depth of three (3) feet. The lower end shall have a 2 by 4 cleat nailed to it to prevent withdrawal of the stake. The exposed one (1) foot shall be painted traffic white and the depth to the side sewer or tee shall be indicated in black paint on the 2 by 4. In addition, a length of 12 gauge galvanized wire shall be provided to extend from the plugged end of the side sewer or tee. The upper end shall emerge at the four (4) foot stake, but shall not be fastened to it.
- C. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- D. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- E. Install manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- F. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- G. Install gravity-flow, nonpressure, drainage piping according to the following:
1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
  2. Install piping with 36-inch minimum cover.
  3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
- H. Install force-main piping as shown on the plans

1. Install piping with restrained joints at horizontal and vertical changes in direction. Use cast in place concrete supports and anchors or corrosion resistant rods and clamps.
  2. Install piping with 36-inch minimum cover unless otherwise indicated on plans.
- I. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.
- J. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

## 0.2 PIPE JOINT CONSTRUCTION

- A. Where specific joint construction is not indicated, follow piping manufacturer's written instructions.
- B. Install pressure pipe according to ASTM F645
- C. Join gravity-flow, nonpressure, drainage piping according to the following:
1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
  2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
  3. Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints.
  4. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-gasket joints.
  5. Join dissimilar pipe materials with nonpressure-type, flexible couplings.

## 0.3 MANHOLE INSTALLATION

- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with gaskets according to ASTM C 443.

- C. Form continuous concrete channels and benches between inlets and outlet.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.

#### 0.4 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  - 1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
  - 2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
  - 3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
  - 4. Use extra-heavy-duty, top-loading classification cleanouts in roads.
- B. Set cleanout frames and covers in earth in cast-in-place-concrete block, per plans. Set with tops 1-inch above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

#### 0.5 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains.
- B. Make connections to existing piping and underground structures so finished Work complies with requirements specified for new Work.

#### 0.6 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  3. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to requirements of authorities having jurisdiction.
  3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate report for each test.
  5. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
    - b. Option: Test concrete gravity sewer piping according to ASTM C 924.
- C. Manholes: Perform hydrostatic test according to ASTM C497.
- D. Leaks and loss in test pressure constitute defects that must be repaired.
- E. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

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DAYTON SPLASH PADS

END OF SECTION



## SECTION 22 1316 - SANITARY WASTE AND VENT PIPING SYSTEMS

### 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 sanitary drainage and vent piping, and storm drainage piping inside building and to locations indicated.
- B. Related Sections include the following:
  - 1. Division 2 Section "Sewerage and Drainage" for sanitary sewerage and storm drainage.
  - 2. Division 2 Section "Foundation Drainage Systems" for foundation drains.
  - 3. Division 2 Section "Interceptors" for sewerage and drainage system interceptors.

#### 1.3 DEFINITIONS

- A. Sewerage Piping: Building sewer piping outside building that conveys sanitary sewage from building.
- B. Drainage Piping: Building sewer piping outside building that conveys storm drainage from building.
- C. Service Entrance Piping: Drainage piping at entry into building between outside building sewer piping and inside drainage piping.
- D. Drainage and Vent Piping: Piping inside building that conveys waste water and vapors from fixtures and equipment throughout the building.
- E. Force-Main Piping: Drainage piping, under pressure.
- F. The following are industry abbreviations for plastic and other piping materials:
  - 1. ABS: Acrylonitrile-butadiene-styrene.
  - 2. EPDM: Ethylene-propylene-diene polymer, rubber.
  - 3. NBR: Acrylonitrile-butadiene rubber.
  - 4. PVC: Polyvinyl chloride.

#### 1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:

1. Soil, Waste, and Vent Systems: 10-foot head of water (30 kPa).
2. Storm Drainage Systems: 10-foot head of water (30 kPa).
3. Sewage, Force-Main Piping Systems: 100 psig (690 kPa).

#### 1.5 SUBMITTALS

- A. Test Results and Reports: Specified in "Field Quality Control" Article.

#### 1.6 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.
- B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

### PART 2 - PRODUCTS

#### 2.1 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. Hub-and-Spigot, Cast-Iron Soil Pipe: ASTM A 74, Service and Extra Heavy classes. Include ASTM C 564 rubber gasket, with dimensions required for pipe class, for each hub.
- C. Hubless, Cast-Iron Soil Pipe: ASTM A 888 or CISPI 301.
- D. Hard Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.
- E. Hard Copper Tube: ASTM B 306, drainage tube, drawn temper.
- F. PVC Plastic Pipe: ASTM D 2665, Schedule 40.

#### 2.2 PIPE AND TUBE FITTINGS

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Threaded-Fitting, End Connections: ASME B1.20.1.
- C. Hubless, Cast-Iron, Soil-Pipe Fittings: CISPI 301.

- D. Cast-Iron Sovent Fittings: ASME B16.45 drainage-pattern aerator and deaerator.
- E. Copper, Solder-Joint Drainage Fittings: ASME B16.23 cast copper or ASME B16.29 wrought copper.
- F. Copper Sovent Fittings: ASME B16.32 cast copper, drainage-pattern aerator and deaerator.
- G. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper. Furnish wrought-copper fittings if indicated.
- H. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.
- I. Bronze Flanges: ASME B16.24, Class 150, bronze, with solder-joint end.
- J. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends.
- K. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket joint, metal-to-metal bronze seating surfaces, and female threaded ends with threads according to ASME B1.20.1.
- L. Cast-Iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
- M. Cast-Iron, Threaded Drainage Fittings: ASME B16.12, galvanized, recessed, drainage pattern.
- N. Cast-Iron, Threaded Flanges: ASME B16.1, Class 125.
- O. Steel, Grooved-End Fittings: ASTM A 47 (ASTM A 47M) malleable-iron casting, ASTM A 106 steel pipe, or ASTM A 536 ductile-iron casting with dimensions matching steel pipe.
- P. Ferrous Expansion Joints: Compound, galvanized steel fitting with telescoping body and slip-pipe section. Include packing rings, packing, limit rods, chrome-plated finish on slip-pipe section, and flanged ends.
- Q. Ferrous, Double Expansion Joints: Compound, galvanized steel fitting with telescoping body and 2 slip-pipe sections. Include packing rings, packing, limit rods, chrome-plated finish on slip-pipe sections, and flanged ends.
- R. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311 drain, waste, and vent pipe patterns.
- S. PVC Plastic, Tubular Fittings: ASTM F 409 drainage pattern, with ends as required for application.

## 2.3 JOINING MATERIALS

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.
- B. Refer to Division 22 Section "Common Results for Plumbing" for commonly used joining materials.
- C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.
- D. Hubless, Cast-Iron, Soil-Piping Couplings: ASTM C 1277 assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve or gasket with integral, center pipe stop. Include the following:
  - 1. Heavy-Duty, Stainless-Steel Couplings: ASTM A 666, Type 304, stainless-steel housing or shield; and stainless-steel clamps. Include gasket.
    - a. Clamp Width: 3 inches (75 mm) wide with 4 clamps, for piping 1-1/2- to 4-inch NPS (DN40 to DN100).
    - b. Clamp Width: 4 inches (100 mm) wide with 6 clamps, for piping 5- to 10-inch NPS (DN125 to DN250).
- E. Transition Couplings: Coupling or other manufactured fitting same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.
- F. Flexible, Transition Couplings for Underground, Nonpressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends same sizes as piping to be joined and include corrosion-resistant metal band on each end.
  - 1. Sleeve Type for Plain-End Piping: Rubber or elastomeric sleeve and stainless-steel band assembly, fabricated to match outside diameters of piping to be joined. Include the following:
    - a. Sleeves for Cast-Iron Soil Piping: ASTM C 564 rubber.
    - b. Sleeves for Plastic Piping: ASTM F 477 elastomeric seal.
    - c. Sleeves for Dissimilar Piping: Compatible with piping materials to be joined.
    - d. Bands: Stainless steel, one at each pipe insert.
  - 2. Gasket Type for Dissimilar-End Piping: Rubber or elastomeric compression gasket, made to match inside diameter of pipe or hub, and outside diameter of adjoining pipe. Include the following:
    - a. Gaskets for Cast-Iron Soil Piping: ASTM C 564 rubber.
    - b. Gaskets for Plastic Piping: ASTM F 477 elastomeric seal.
    - c. Gaskets for Dissimilar Piping: Compatible with piping materials to be joined.

## 2.4 VALVES

- A. Refer to Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves. Use valves specified for "Domestic Water Systems" applications.

### PART 3 - EXECUTION

#### 3.1 EXCAVATION

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

#### 3.2 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Above ground, Sanitary Waste and Vent Piping: Use either of the following materials:
  - 1. Hubless, cast-iron soil piping:
    - a. Couplings: Compact, stainless steel.
  - 2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
- D. Underground, Sanitary Waste and Vent Piping: Use the either of the following materials:
  - 1. Hub-and-Spigot pipe and fittings.
  - 2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

#### 3.3 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Shutoff Duty: Use ball valves.
  - 2. Throttling Duty: Use ball valves.
- B. Grooved-end butterfly valves may be used with grooved-end piping.

#### 3.4 PIPING INSTALLATION, GENERAL

- A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping installation.

#### 3.5 SERVICE ENTRANCE PIPING INSTALLATION

- A. Refer to Division 2 Section "Sewerage and Drainage" for sanitary and storm sewer piping.

- B. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.
- C. Extend building storm drain piping and connect to storm sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building storm drains and building storm sewers.
- D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for sleeves and mechanical sleeve seals.
- E. Install wall penetration system at each service entrance pipe penetration through foundation wall. Make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for wall penetration systems.

### 3.6 DRAINAGE AND VENT PIPING INSTALLATION

- A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.
- C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  - 1. Sanitary Building Drain: 2 percent downward in direction of flow for piping 3-inch NPS (DN80) and smaller; 1 percent downward in direction of flow for piping 4-inch NPS (DN100) and larger.
  - 2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.
  - 3. Storm Building Drain: 1 percent downward in direction of flow.
  - 4. Horizontal, Storm Drainage Piping: 2 percent downward in direction of flow.
  - 5. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- E. Install engineered, sanitary drainage and vent systems in locations indicated and as follows:

1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
  2. Copper, Sovent, Single Stack: Comply with CDA 402/0, "Brass and Bronze Design Handbook, Single-Stack Plumbing System."
  3. Cast-Iron, Sovent, Single Stack: Comply with ASSE 1043 and sovent fitting manufacturer's written installation instructions.
  4. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.
- F. Install engineered, controlled-flow, storm drainage systems in locations indicated. Comply with standards of authorities having jurisdiction.
- G. Sleeves are not required for cast-iron soil piping passing through concrete slab on grade if slab is without membrane waterproofing.
- H. Install PVC plastic drainage piping according to ASTM D 2665.
- I. Install underground, PVC plastic drainage piping according to ASTM D 2321.

### 3.7 JOINT CONSTRUCTION

- A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping joint construction.
- B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
1. Compression Joints: Make with rubber gasket matching class of pipe and fittings.
  2. Hubless Joints: Make with rubber gasket and sleeve or clamp.
- C. Grooved Joints: Assemble joints with coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- D. PVC Piping Joints: Join drainage piping according to ASTM D 2665.
- E. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling during joining of plastic pipe and fittings.

### 3.8 VALVE INSTALLATION

- A. Shutoff Valves: Install shutoff valve on each pump discharge and where indicated. Use gate or ball valves for piping 2-inch NPS (DN50) and smaller.
- B. Check Valves: Install swing check valve on each pump discharge, downstream from shutoff valve.

### 3.9 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices. Install the following:

### 3.10 CONNECTIONS

- A. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage piping to service entrance piping, and extend to and connect to the following:
  - 1. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
  - 2. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection.
- C. Connect force-main piping to service entrance piping, and extend to and connect to the following:
  - 1. Sump Pumps: Connect force-main piping to sump-pump discharge.
  - 2. Sewage Pumps: Connect force-main piping to sewage-pump discharge.

### 3.11 FIELD QUALITY CONTROL

- A. Inspect drainage and vent piping as follows:
  - 1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
  - 2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
    - a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    - b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
  - 3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
  - 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:
  - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
  3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10 feet of head (30 kPa). Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.
  4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
  5. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.
  6. Prepare reports for tests and required corrective action.
- C. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:
1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
  2. Cap and subject piping to static-water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
  3. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.
  4. Prepare reports for tests and required corrective action.

### 3.12 CLEANING AND PROTECTING

- A. Clean interior of piping system. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with 2 coats of water-based latex paint.

END OF SECTION 22 1316



## SECTION 22 1319 - SANITARY WASTE PIPING SPECIALTIES

### 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 sanitary drainage piping specialties:
  - 1. Cleanouts.
  - 2. Floor drains.
  - 3. Miscellaneous piping specialties.
  - 4. Sleeve penetration assemblies.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

#### 1.4 SUBMITTALS

- A. Not used.

#### 1.5 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

### PART 2 - PRODUCTS

#### 2.1 CLEANOUTS

- A. Cast iron cleanouts, comply with ASME A112.36.2M.

#### 2.2 FLOOR DRAINS

- A. Cast iron floor drains, comply with ASME 112.21.1M.
- B. Cast iron trench drains, comply with ASME A112.21.1M
- C. Cast iron open drains, cast iron deep seal traps and related fittings.

### 2.3 MISCELLANEOUS PIPING SPECIALTIES

- A. Sanitary hydrants, stop and waste drain valves, trap seal primer valves, horizontal backwater valves, drain outlet backwater valves, air admittance valves, stack flashing fittings, vent caps, vent terminals, roof flashing assemblies.

### 2.4 SLEEVE PENETRATION SYSTEMS

- A. Comply with UL 1479, through penetration firestop assembly.

## PART 3 - EXECUTION

### 3.1 FIELD QUALITY CONTROL

- A. Inspections shall be made in accordance with the requirements of the owner and Boone County.
- B. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 22 1319

SECTION 26 00 00 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 SCOPE

- A. The base bid shall include furnishing all materials, labor, tool, equipment and installation of all work required to install complete electrical systems as shown on the plans and outlines in all Division-26 sections.
- B. Submittal of a bid indicates that the contractor has visited the site, has examined the drawing/specifications of all trades and has included all required allowances.
- C. Contractor shall be designated as the contractor or sub-contractor for that section of work unless specifically stated otherwise.
- D. Work includes but is not limited to the following.
  - 1. Providing all new electrical work as required to accommodate new construction.
  - 2. Provide all necessary distribution equipment, conduit and wiring as shown on the drawings.
  - 3. Provide all necessary wiring of baseboard heaters and infrared heaters. Provide all necessary wiring to all other HVAC systems shown on drawings.
  - 4. Provide all necessary wiring to electric water heaters.
  - 5. Provide all necessary wiring to duplex receptacles and all other outlets shown on the plans.
  - 6. Provide and install all lighting fixtures, switches and lighting controls as specified.
  - 7. Provide and install all exit/emergency lighting as shown on the drawings.
  - 8. Provide temporary electrical service and all required GFCI outlets required for electrical construction.
  - 9. Provide and install conduit system for data/phone wiring to be completed by others.
  - 10. Contractor shall coordinate with building owner for installation of certain spare conduits and junction boxes for future use.
  - 11. Provide all necessary pool bonding in accordance with all pertinent NEC code articles.
  - 12. Provide all necessary electrical inspections. Inspections for all necessary pool bonding inspections are to be included.
- E. The following work is not included under this contract.

1. Painting of any equipment, except as hereinafter mentioned in the specifications or shown drawings.
2. Temperature Control Wiring, except as hereinafter mentioned in the specifications or shown on drawings.

## 1.2 SPECIAL CONDITIONS

- A. Owner's representative or engineer shall be permitted to relocate any fixture, device or equipment outlet prior to installation within a 15-foot limit at no additional change in contract price.
- B. The electrical contractor shall complete their work or any part thereof at such time as may be designated by the owner's representative, so that it can be used for temporary or permanent use. Such use or the system shall not be construed as an acceptance of same by owner.

## 1.3 MATERIALS AND EQUIPMENT

- A. Material installed shall be new, full weight, of the best quality. All similar materials shall be of the same type and manufacturer. All materials, apparatus and equipment shall bear the Underwriter's Laboratory, Inc. label where regularly supplied.
- B. Contractor is responsible for the safety and good condition of the material and equipment installed until final acceptance by the Owner. Materials shall be stored to prevent damage or weathering prior to installation.
- C. When several materials, products or items of equipment are specified by name for one use, the contractor may select any one of those specified and shall include with the bid an Equipment List listing that equipment selected.
- D. Bidders may bid on other materials, products or equipment. All material manufacturers listed in the contract documents as an equal shall be equal in quality, performance, aesthetics, and product support (factory and local) to that specified. Other products, material, article, device, fixture or form of construction not mentioned as approved equal must be approved by the Engineer. Request for approval must be made in writing and approved by the Architect ten (10) days prior to bid opening date, and issued by addendum.
- E. The responsibility for costs incurred from deviation from the base equipment shall be the equipment supplier and this contractor. Use of any equipment will be considered as a statement that clearances and arrangements have been checked and found satisfactory.

## 1.4 GENERAL STANDARDS

- A. The applicable provisions of the following standards shall govern. All electrical equipment must contain UL label and be manufactured and assembled in the USA.

- B. All work shall be installed in strict accordance with the latest edition of all applicable codes including (but not limited to) the following codes and standards.
1. National Electrical Code, NFPA 70.
  2. NFPA 70E
  3. Life Safety Code, NFPA 101.
  4. Other Provisions of NFPA as applicable.
  5. Local Electrical Codes.
  6. Local utility company requirements.
  7. ADA/ADAAG requirements'
  8. ASME.
  9. Kentucky Building Code.
- C. For the purposes of clearness and legibility, drawings are essentially diagrammatic and although size and locations of equipment are drawn to scale wherever possible, Subcontractor shall make use of all data in all of the contract drawings and shall verify this information at building site.
- D. The drawings indicate required size and points of termination of conduit and suggest proper routes to conform to the structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets, and it shall be the work of this section to install conduit and equipment in such manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear without further instructions or cost to the Owner.
- E. The electrical contractor shall coordinate electrical work with all other trades and locate/install all equipment and devices accordingly. This contractor shall also refer to coordination drawing of the other trades. And mechanical and/or electrical work fabricated or installed before the above referenced coordination with all other trades will be down at the respective contractors' risk.
- F. It is intended that all apparatus be located symmetrical with architectural elements and shall be installed at exact height and locations as shown on architectural drawings.
- G. The Subcontractor shall fully inform himself regarding all peculiarities and limitations of space available for installation of all work and materials furnished and installed under the contract. The electrical contractor shall exercise due and particular caution to determine that all parts of the installed electrical work are made quickly and easily accessible. Although the locations of the equipment and conduit may be shown on the drawings in certain positions, the electrical contractor shall be guided by the architectural details and conditions existing at the job site, correlating electrical work with that of others. Provide all offsets as required to provide a neat workmanlike arrangement.
- H. Immediately upon award of contract and before any work is started, the electrical contractor shall confer with the Engineer's representative concerning the work under these sections.

## 1.5 PERMITS AND REGULATIONS

- A. All electrical materials used in this work and all workmanship tests performed therein, unless otherwise specified shall conform to the latest rules, regulations and specifications of the National Electrical Code, the National Board of Fire Underwriters, local and state codes having jurisdiction and utility company.
- B. Any discrepancy between these drawings and specifications and the codes, laws, ordinances, rules and regulations shall be immediately brought to the attention of the Engineer, prior to any installation.
- C. This contractor shall obtain and pay for all permits or certificates of inspection and approval required for this branch of the work.
- D. Owner shall be furnished with certificates of final inspection and approval prior to final acceptance of this branch of the work.

#### 1.6 SUBMITTALS

- A. All items of material and equipment shall be listed on an Equipment List prepared by the Subcontractor and shall be reviewed by the Engineer prior to the start of any work. Submittal shall be provided in a timely manner allowing for long lead items. No item of equipment will be permitted on the site until acceptance of that equipment has been given. Copies of drawings and manufacturer cuts and performance data will be required for approval. Submittals shall be organized in same order as listed in equipment list and include reference to page and paragraph numbers of the specifications and shall be bound in sets; all sets identical. The subcontractor is not authorized to purchase any material until the shop drawings are approved by the Engineer.
- B. Submittals shall clearly indicate sufficient definition so that they can be properly reviewed for compliance with contract documents.
- C. See Division 1 Section "Submittals".

#### 1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver equipment and material according to factory shipping requirements. Pack components in factory fabricated protective containers. Units shall be delivered in sections of such size as will pass through available openings.
- B. Store equipment and materials in clean dry place and protect from weather and construction traffic. When stored inside, do not exceed structural capacity of the floor.
- C. Handling and rigging of equipment and products shall be as recommended by the manufacturer. Components and equipment damaged during shipment or handling shall not be installed. Replace and return damaged components to the manufacturer.

#### 1.8 QUALITY ASSURANCE

- A. Contractor, if requested, shall demonstrate ability to perform all work to be included under the contract. Assurance if requested, shall be in the form of a list of past projects of similar size and complexity and a list of six (6) references pertaining to those projects. Failure to demonstrate these quality assurances shall be taken as a statement of the contractor's inability to perform.
- B. Contractor shall have a minimum five (5) years experience in the installation of electrical systems similar to the system specified.
- C. The quantity or quality level shown or specified shall be the minimum provided or performed. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Should there be a conflict between the plans and specifications, the greater quantity or better quality shall be furnished.
- D. Install all equipment and materials in strict accordance with manufacturer's written instructions.
- E. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified by applicable UL standards. Accomplish tightening by utilizing proper torquing tools, including torque screwdriver, beam-type torque wrench, and ratchet wrench with adjustable torque settings. Ensure that sealing grommets expand to form watertight seal.
- F. Upon completion of installation of equipment and electrical circuitry, energize circuitry and demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.
- G. Prior to energizing, check installed wired and cables with megohm meter to determine insulation resistance levels to assure requirements are fulfilled. Prior to energizing, test wires and cables for proper phase to phase connections, for electrical continuity and for short-circuits. Ensure that directions of rotation of each motor fulfills requirement.

#### 1.9 SPECIFICATIONS AND TERMINOLOGY

- A. Wherever the words "(the) contractor", "(this) contractor", "(the) subcontractor", "(this) subcontractor", "E.C./EC" or similar terms appear in Division 26 specifications or on electrical drawings, it shall refer to the Electrical Contractor (or sub-contractor of the Electrical Contractor where applicable).
- B. Wherever the terms "provide", "to be" or similar terms appear in Division 26 specifications or on electrical drawings, it shall be interpreted to mean that the electrical contractor shall "furnish and install", including all necessary accessories to render respective work fully operational.

- C. Wherever the work “work” appears in Division 26 specifications or on electrical drawings, it shall be interpreted to mean any and all labor, materials, accessories, services, etc. necessary to fulfill project requirements.
- D. Wherever the work “flush” appears in Division 26 specifications or on electrical drawings, it shall be interpreted to mean “recessed in respective surface with visible face flush/even with respective surface”.
- E. Specifications shall be interpreted in connection with the drawings, and if anything is shown on drawings and not mentioned in the specifications, or vice versa, it is to be included in the work same as though clearly set forth by both. Furthermore, all materials or labor previously required to fully complete the work shall be included in the contractor’s work even though each item necessary involved be no specifically mentioned or shown. Such work and/or materials shall be the same grade or quality as the parts actually specified and shown. Should there be a conflict between the plans and specifications, the greater quantity or better quality shall be furnished.

#### 1.10 TEMPORARY ELECTRICAL SERVICE

- A. Unless directed otherwise, the general contractor will pay for all temporary electric usage for all trades during construction.
- B. The electrical contractor shall provide and maintain all power lines (including circuit protection, physical protection, grounding, etc.) for temporary purposes (electrical wiring, lighting, etc.)
- C. Route all temporary service lines on the site overhead as required so that the work does not interfere with existing site operations or new construction related work of any trade. Unless directed otherwise in field by owner’s representative, all overhead lines shall be at least 18 feet (from the lowest point) above grade/pavement. Coordinate carefully in field prior to installation. All overhead lines shall be properly supported by messenger cable, shall be physically protected at risers and drops and shall be properly mounted to supporting structures with insulators and drip loops.
- D. Make all necessary arrangements with local utility companies for temporary electrical service and pay all associated fees for inspections, connections, initiation, etc.
- E. Electrical contractor shall furnish all temporary light (including lamps) and power complete with all wiring and similar equipment as required, for all work on the site and within the affected buildings during the construction period. Feeders shall be properly fused and ground fault protected per NEC and per all authorities having jurisdiction. Feeders and lamps shall be physically protected along their entire length. Temporary branch circuit wiring shall be installed per NEC in each area with outlets on minimum ten-foot centers to accommodate lamps and with receptacles on nominal fifty-foot centers to accommodate extension cords provided by the contractor in need of them.
- F. The electrical contractor shall furnish and maintain all lamps required for the duration of the job. Sufficient sockets and circuit capacity shall be provided for all constructions

areas. A minimum of 10-foot candles of illumination shall be maintained in all spaces or as required by OSHA. Provide all necessary specialty temporary power and/or supplementary light for all trades requiring same. At the conclusion of the project, all temporary electric service materials shall be removed by the electrical contractor and become the property of same.

#### 1.11 PROJECT CLOSEOUT

##### A. General

1. Final payment of contract will not be made until receipt, review and acceptance, by the owner's representative, of all documentation defined hereafter.
2. Where applicable, refer to applicable General Conditions and similar sections of the project manual for details on record drawing submittals. In addition to the requirements specified in Division 1 or other applicable project manual sections, include the following as a minimum.
3. Owner shall be furnished with certificate of final inspection and approval prior to final acceptance of this branch of the work.
4. Test all electrical work and ensure that it rings entirely free from ground.
5. At the conclusion of the project when the system is in full operations, the electrical contractor shall make a final balance of circuits. The electrical contractor shall provide necessary labor, metering, etc., to accomplish this task. Provide written documentation.
6. The electrical contractor shall be responsible for the proper instruction of all equipment and systems to the satisfaction of the owner's representative.

##### B. Maintenance Manuals

1. In addition to the requirements specified in Division 1 or the other applicable project manual sections, include the following.
2. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
3. Manufacturer's printed operating procedures shall include start-up, break-in, normal operating instructions, regulation, control, stopping, shutdown, and emergency instructions.
4. Provide a minimum of three neatly bound (3-ring binder) copies of maintenance and instruction (O&M) manuals, including a parts list pertaining to all equipment furnished and/or installed by the electrical contractor. Submit to owner's representative for review. Manuals shall be bound in hard cover, post type binders. Manuals shall contain the following as a minimum:
  - (1) Index, typed at front w/typed tabs for each section; Lists of all material and equipment furnished with name, address and telephone number of vendor;
  - (2) Itemized list of each piece of mechanical equipment having electrical connections with circuit and panelboard locations. Also list with each item any related expendable equipment required such as fuse size and type, pilot lights, Cat. No. of magnetic starter overload, etc.;

- (3) Operating Instruction Manuals and Service Manuals for all equipment furnished by the Electrical Contractor;
- (4) A complete set of final approved shop drawings as submitted during construction;
- (5) An itemized list of each fixture type with catalog number of replacement lamps and ballasts.
- (6) A complete spare parts schedule for all components of all equipment furnished and/or installed under this contract; the schedules shall not be factory generic information, but shall be complete and accurate for the equipment actually provided.
- (7) A complete set of detailed wiring diagram and schematic drawings for all components of all systems furnished and/or installed under this contract; the drawing shall not be factory generic information, but shall be complete and accurate for the equipment actually provided.

END OF SECTION

SECTION 26 0500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 HEIGHT OF BOXES

- A. Outlet mounting heights as indicated on the plans are approximate for bidding purposes only. The exact mounting height (and locations) of outlets shall be determined in the field with relation to architectural detail and equipment being served. It shall be the responsibility of the electrical contractor to coordinate outlet location with equipment, with furniture plans and with architectural elevation plans. Where mounting heights are not detailed or dimensioned, contact the owner's representative for direction.
  
- B. Prior to rough-in, coordinate final mounting heights of all system outlet boxes in field with Owner's representative. Height of boxes dimensioned from ceiling as given above apply to rooms having ceiling 9' or less. In rooms having higher ceilings, these outlets shall be located as directed in the field. Height of boxes from finished floor to center of boxes shall be as follows, unless directed otherwise in field or otherwise noted on electrical plans or architectural plans.
  - 1. Switches
    - a. Counter - 3'-8" (verify and match counter receptacle heights)
    - b. Elsewhere - 4'-0"
  
  - 2. Receptacles
    - a. Counters - 3'-8" (verify)
    - b. Elsewhere - 1'-6" to bottom of box
  
  - 3. Telephone Outlets/Data Outlets
    - a. Desk Phone - 1'-6"
    - b. Wall Phone - 4'-0"
  
  - 4. Starters - 4'-0"
  - 5. Disconnects - 4'-0"
  - 6. Circuit Breaker Panelboards - 6'-0" to top of panel
  - 7. Wall Mounted Light Fixtures - As noted on plans or as directed by Architect
  - 8. Clock Outlets - 1'-0" below ceiling to top of clock (verify)
  - 9. Television Outlets (MATV/CATV) - 1'-6"
  - 10. Desktop/Tabletop/Portable Sets - 1'-6"
  - 11. Wall/Ceiling Bracket Sets - 1'0"
  - 12. Occupancy Sensors
    - a. Wallbox Switches - 4'0"
    - b. Others - See Mfg. Literature
  - 13. Other Outlets/Fixtures/Equipment - As Directed by Architect

1.2 ACCESS DOORS

- A. Access doors shall not be used unless special prior written permission is granted from the Owner's representative. All pull boxes, junction boxes, etc. shall be installed in areas which are readily accessible after completion of construction. Pull boxes and junction boxes shall not be installed above gypsum board or similar ceiling systems. Where there is no other recourse but to provide and access door/panel and where approval of Owner's representative has been obtained, provide all required access door/panels as required for a complete code-compliant electrical installation as defined below.
- B. For installation in masonry, concrete, ceramic tile, or wood paneling provide 1 inch-wide-exposed perimeter flange and adjustable metal masonry anchors. For gypsum wallboard or plaster provide perforated flanges with wallboard bead. For full-bed plaster applications provide galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.
- C. Set frames accurately in position and securely attached to supports, with face panels plum and level in relation to adjacent finish surfaces. Adjust hardware and panels after installation for proper operation. Locking devices shall be flush, screwdriver-operated cam locks.
- D. Provide factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces. Frames shall be 16-gauge, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, pre-cast, or cast-in-place concrete, ceramic tile, or wood paneling. Standard Flush Panel Doors shall be 14-gauge steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory applied prime paint. Fire-Rated Units shall be insulated flush panel doors, with continuous piano hinge and self-closing mechanism.
- E. Subject to compliance with requirements, provide products by one of the following:
  - 1. Bar-Co., Inc.
  - 2. J.L. Industries
  - 3. Karp Associates, Inc.
  - 4. Milcor Div. Inryco, Inc.
  - 5. Nystrom, Inc.

### 1.3 ELECTRICAL INSTALLATIONS

- A. All electrical work installed in finished areas shall be concealed. All electrical work installed in unfinished areas may be exposed at the discretion of the Owner's representative. Where exposed conduit and boxes are installed in areas which are already finished, such work shall be painted by the electrical contractor to match adjacent surfaces as directed in field.
- B. Arrange for chases, slots, and openings in other building components during the progress of construction, to allow for electrical installations. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the work.
- C. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible.

- D. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and architectural/structural components.
- E. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations.
- F. Install systems, materials and equipment giving right-of-way priority to systems required to be installed a specified slope.
- G. Project the structure, furnishings, and adjacent materials not indicated or scheduled to be removed.
- H. Verify all dimensions by field measurements. Take measurements and be responsible for exact size and locations of all openings required for the installation of work. Figured dimensions are reasonably accurate and should govern in setting out work. Where detailed method of installation is not indicated or where variations exist between described work and approved practice, direction of the owner's representative on job shall be followed. Where applicable, remove and/or relocated any existing electrical work conflicting with new construction.
- I. Branch circuits shall be installed as shown on the plans. The symbols used to indicate the purpose of which the various outlets are intended are identified in the legend. Where outlets are indicated by letters on plans, they shall be controlled by corresponding switches.
- J. No wire size smaller than No. 12 shall be used for any branch circuit unless otherwise noted on plans for control circuits. Larger sizes shall be used where required and/or indicated on the plans. Minimum conduit size shall be 3/4".
- K. Device or fixture outlets shall not be installed directly back to back, where located on opposite sides of common walls. Outlets shall be offset by at least two feet.
- L. All wires shall be run continuous from outlet to outlet and all joints shall be properly spliced. Insulation value of joints shall be 100% in excess of that of the wire. Mechanical wire splicers may be used. Friction and rubber tape shall conform to Federal Specifications HH-T-11 and HH-T-111. Plastic electrical tape shall be Scotch #33 or approved equal. The conductors terminating at each wired outlet shall be left not less than 6" long at their outlet fittings to facilitate installment of devices of fixtures.
- M. If during construction it becomes apparent that certain minor changes in layout will effect a neater job or better arrangement, such alterations shall be made a part of the contract. Engineer's review shall be obtained before making such changes.
- N. Workmanship throughout shall conform to the standards of best practice. Marks, dents or finish scratches will not be permitted on any exposed materials, fixtures or fittings. Inside of panels and equipments boxes shall be left clean.

#### 1.4 COORDINATION

- A. Coordination shall commence immediately upon award of contract. Failure of this contractor in coordinating (including providing related information to other trades for review) in a timely manner, shall not result in any subsequent additional reimbursement, special allowances or additional construction time being made for any facet of the project. Any work fabricated or installed before properly coordinating with all other trades will be done at this contractor's risk.
- B. Plans are diagrammatic indicating design intent and indicating required size, points of termination and, in some cases, suggested routes, all necessary offsets, etc. All ductwork, piping, conduit, raceways, cable assemblies, etc. shall be run as straight as possible and symmetrical (perpendicular to or parallel with) architectural items. Work installed diagonal to building members shall not be permitted. The contract document drawings are an outline to indicate the approximate location and arrangement of ductwork, piping, equipment, outlets, raceways, cables, etc.
- C. The electrical contractor shall work in harmony with all building contractors and sub-contractors, so as not to cause any delays in pouring concrete, building masonry wall, etc. The location of risers and branch conduits are approximate, but owing to the lack of space in some instances, all trades must work in harmony to insure space and satisfactory arrangement for all work to be installed under this contract. The electrical contractor shall consult the Architectural, Plumbing, HVAC and Structural plans in all instances before installing electrical work so that electrical work will not interfere with those branches.
- D. This contractor shall participate in coordination efforts and in preparation of coordination drawings prior to fabrication or installation of any equipment, materials, etc. Coordinate actual clearances of all installed equipment. Exact location of electrical outlets, lighting fixtures, conduits, raceways, equipment, cable assemblies, applicable devices, etc. and of mechanical equipment, piping, ducts, fixtures, diffusers, grills, louvers, dampers, etc., shall be coordinated well in advance by all affected contractors so there will be no interferences at installation between the various trades. Ensure that work of all trades, as well as working clearances, in electrical rooms or spaces complies with NEC Article 110.
- E. Conflicts in equipment and materials shall be corrected prior to installation. Should there be a conflict with drawings of other trades, this contractor shall work with the trades to correct the conflict while coordinating representative for a final decision as to method of material. Any work installed or equipment placed in position by this contractor creating a conflict shall be readjusted to the satisfaction of the owner's representative at the expense on this contractor.

#### 1.5 IDENTIFICATION

- A. General
  - 1. Submit manufacturer's data on electrical identification materials and products. Submit detailed nameplate schedule indicating proposed nomenclature, colors, text heights, fastening methods, etc. If requested by Owner's representative, submit samples of each

color, lettering style and other graphic representations required for each identification material or system.

2. Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option, but provide single selection for each application. Where identification is to be applied to surfaces which require finish, install identification after completion of painting. Comply with governing regulations and requests of governing authorities for identification of electrical work.

B. Cable and Conductor Identification

1. Provide manufacturer's standard vinyl-cloth self-adhesive conductor markers of wrap-around type, either pre-numbered plastic coated type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification. Provide on all conductors of all systems. All conductors of all systems shall have color coded insulation. All cables of all systems shall have color coded jackets. Match color schemes with marking systems used in existing systems (where applicable), shop drawings, contract documents, and similar previously established identification of project's electrical work. Apply cable/conductor identification of each cable in each box/enclosure/cabinet for cables which are not available with color coded insulation or jackets.
2. The following insulation color code shall be used for power systems and voltage identification. This shall apply to both feeder and branch circuit wiring. Interchange of colors shall no be permitted. The use of scotch color coding tapes for phase identification is not permitted. Branch circuit and feeder conductor insulation shall be color coded throughout entire length.
  - a. 208/120V system - Black, Red, Blue and White
  - b. Equipment Grounding - Green
3. Engraved Plastic-Laminate Signs
  - a. Install signs at locations for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with stainless steel fasteners, except use permanent adhesive where fasteners should not or cannot penetrate substrate.
  - b. All equipment and systems identification nomenclature shown on drawings or listed herein is shown for general design and installation reference only. The actual nameplate, etc. nomenclature for the project shall be verified by electrical contractor in field prior to fabrication and where applicable, shall be an extension of existing nomenclature used on the site as determined in field by electrical contractor. Record documents shall be prepared accordingly. Unless determined otherwise in field, provide text matching terminology and numbering of the contract documents and shop drawings.
  - c. Unless directed otherwise, provide black face and white core plies (letter color) for normal power applications and red face and white core piles (letter color) for emergency power applications, punched for mechanical fastening except where adhesive mounting is mandatory because of substrate. For healthcare facilities,

non-essential equipment shall have black face and white core plies, essential shall have orange face and white core, and critical shall have red face and white core. Provide 1/2" minimum text height for all equipment identification and 1/4" minimum text height for all nameplates with narrative descriptions/instructions. Thickness shall be 1/16", for units up to 20 sq. in. or 8" length; 1/8" for larger units. As a minimum provide signs for each unit of the following categories of electrical work where such work exists on the project.

- 1) Electrical access panel doors.
- 2) Starters, disconnects, contactors and control stations.
- 3) Panelboards, electrical cabinets and enclosures.
- 4) Control panels for all systems.
- 5) Electrical switchboards and switchgear (include company name of engineer and installing contractor at all service entrance switchboards).
- 6) Switch wall plates (via engraving) for all switches that control remote lights of loads.
- 7) Other similar equipment designated by owner's representative or engineer in field.

## 1.6 CUTTING, PATCHING AND SEALING

### A. General

1. The electrical contractor shall provide all cutting as required for the admission of electrical work unless directed otherwise in field, all related patching and painting (to match surrounding methods, materials and colors) shall be provided by the electrical contractor. Any damage done by this contractor's expense. Perform cutting, fitting, and patching for electrical equipment and materials as required to:
  - a. Uncover work to provide for installation of ill-timed work.
  - b. Remove and replace defective work.
  - c. Remove and replace work not conforming to requirements of the Contract Documents.
  - d. Remove samples of installed Work as specified for testing.
  - e. Install equipment and materials in existing structures.
2. Upon Written instructions from the owner's representative, uncover and restore work to provide for observation of concealed work by owner's representative or by inspection authority having jurisdiction.
3. During cutting and patching operations, protect adjacent installation (structure, finishes, furnishings, etc.). Where applicable, provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to system components and components of other trades.
4. Patch surfaces and building components using new materials matching existing materials and using experienced Installers. Refer to Division 1 for definition of experiences "Installer" or determine qualifications as directed in field by owner's representative.

5. Patching through fire rated walls and enclosures shall not diminish the rating of that wall or enclosure. All materials used for patching shall be installed to meet or exceed the smoke and fire rating of the respective surface being patched.
6. Neatly cut and drill all openings in walls and floors required for the installation. Secure approval of Owner's Representative before cutting and drilling in existing facilities. Neatly patch all openings cut.
7. Cutting and patching shall be held to a minimum by arranging with other contractors for all sleeves and openings before construction is started.

END OF SECTION 26 0500



SECTION 260508 - ELECTRICAL SITE

REQUIREMENTS PART 1 - GENERAL

1.1 SITE INFORMATION

- A. Subsurface conditions may have been investigated during the design of the project. If so, review reports of these investigations. Follow recommendations of these reports.

1.2 PROTECTION OF OPEN EXCAVATIONS

- A. Protect excavated openings with substantial railings, fencing, signage, shoring, and steel roadway plates in strict compliance with OSHA/NIOSH, with local Department of Transportation (DOT) standards, with authorities having jurisdiction, and as directed by owner's representative in field.
- B. Provide traffic detours per DOT standards during active construction work shift time periods.  
Provide related barricades, signage, portable flashing lights, etc. (per DOT standards) at specific locations as determined in field.
- C. Provide steel roadway plates, properly installed and anchored per DOT standards, over roadway cuts during inactive periods (i.e. between construction work shifts, while concrete is curing, and while flowable backfill is curing).
- D. Finish work affecting the roadways, and restore/pave roadway cuts, as quickly as possible after starting those segments of work. Carefully coordinate scheduling for roadway related work to allow adequate time for inspections and curing, while keeping overall related time to a minimum.

1.3 PROJECT CONDITIONS

A. Existing Utilities

- 1. Locate existing underground utilities in excavation areas, which are to remain. Support and protect these services during excavation operations.
- 2. Uncharted or Incorrectly Charted Utilities: Contact utility owner immediately for instructions.
- 3. Provide temporary utility services to affected areas. Give owner's representative minimum 48-hour notice prior to utility interruption.

B. Explosives

- 1. Do not use

explosives. PART 2 - PRODUCTS

## 2.1 MATERIALS

### A. Backfill and Fill Materials

1. Use excavated material for backfill. Prior to backfilling, remove rock and gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetable matter, and other deleterious matter.

### B. Nonshrink, Nonmetallic Grout

1. Provide premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout, recommended for interior and exterior applications.

### C. Flowable Backfill Material

1. Refer to "CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE BACKFILL)" subsection under Part 3 - Execution below.

### D. Subbase

1. Subbase refers to the compacted layer used in pavement systems between the subgrade and the pavement base course material. Provide subbase consisting of graded mixture of crushed gravel, crushed stone, crushed slag, or sand.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavation operations.
- B. Comply with codes in jurisdiction. Provide sloped sides, and shore and brace as required when trenching to achieve stability. Provide excavation and backfilling required for electrical work and consult with utilities prior to beginning excavation. Remove materials of every nature and description encountered in obtaining required lines and grades. Remove excess excavated earth materials from the site.
- C. Properly restore streets, sidewalks, concrete and blacktop surfaces that were broken for installing piping.
- D. Where subsidence occurs at electrical installation excavations during a period of 12 months after Substantial Completion, remove surface treatment (i.e., pavement, lawn, or other finish), add backfill material, compact to specified conditions, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent areas.

### 3.2 EXCAVATION

#### A. Shoring and Bracing

1. Establish requirements for trench shoring and bracing to comply with local codes and authorities. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Slope sides of excavations to comply with local codes and ordinances. Shore and brace as required for stability of excavation. Remove shoring and bracing when no longer required.
2. Install sediment and erosion control measures in accordance with local codes and ordinances.

B. Dewatering

1. Prevent surface water, subsurface water, and ground water from flowing into excavations and from flooding project site and surrounding area.
2. Do not allow water to accumulate in excavations. Remove water to prevent softening of bearing materials. Provide and maintain dewatering system components necessary to convey water away from excavations.
3. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey surface water to collecting/run-off areas. Do not use trench excavations as temporary drainage ditches.

C. Material Storage

1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
2. Locate and retain soil materials away from edge of excavations. Do not store within drip-line of trees.
3. Remove from site, and legally dispose of, excess excavated materials and materials not acceptable for use as backfill or fill.

D. Trenching

1. Excavate trenches to the uniform width, sufficiently wide to provide ample working room.
2. Excavate trenches to depth indicated or otherwise necessary to full project requirements.
3. All trench widths indicated on drawings are minimum required widths.

E. Cold Weather Protection

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.

F. Backfilling and Filling

1. Place soil materials in layers to required elevations for each area classification listed below, using materials specified in Part 2 of this Section.
2. Backfill excavations as promptly as work permits, but not until completion of the following:
  - a. Inspection, testing, and approval.
  - b. Recording locations of underground utilities.
  - c. Removing concrete formwork.
  - d. Curing of concrete.
  - e. Removing shoring and bracing, and backfilling of voids.

- f. Removing trash and debris.

G. Placement and Compaction

1. Place backfill and fill materials in layers of not more than 8 inches in loose depth for material compacted by heavy equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
2. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification specified below. Do not place backfill or fill material on surfaces that are muddy, that are frozen, that contain frost, or that contain ice.
3. Place backfill and fill materials evenly adjacent to structures, piping, and equipment to required elevations. Prevent displacement of raceways and equipment by carrying material uniformly around them to approximately same elevation in each lift.
4. Compact each layer of backfill or fill material to 95 percent standard compaction.

H. Moisture Control

1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water. Apply water in minimum quantity necessary to achieve required moisture content and to prevent water appearing on surface during, or subsequent to, compaction operations.

3.3 CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE BACKFILL)

A. Description

1. Controlled-Low-Strength-Material (CLSM) is a material that has a specified compressive strength of 1200 pounds per square inch (PSI) at 28 days. This material is not concrete and is in a flowable state at the time of placement.

B. Materials

1. Provide CLSM mixture consisting of water, Portland Cement (Type I or II conforming to ASTM C-150, Type "F" fly ash, and fine aggregate.
2. If fly ash is not used, provide CLSM using high dosages of an air entraining admixture to help flowability and lower strength for removability.
3. Non-standard materials may be used only after receiving special permission from owner's representative.
4. Provide water used in mixing and curing that is as clean and free of oil, salt, acid, alkali, sugar, vegetable, and other substances injurious to the finished product as possible. Test water in accordance with the requirements to AASHTO T 26. Water known to be of potable quality may be used without testing.
5. Use fine aggregates conforming to ASTM C 33 in CLSM.

C. Mix Design

1. Provide proportion of materials used in CLSM as follows:

Cement: 50-100 pounds (lbs) per cubic yard  
(cy) Type "F", Fly Ash: 250-300 lbs/cy  
Sand: 2700-2800 lbs/cy  
Water: 400-500 lbs/cy

2. Other proportions may be used only after receiving special permission from owner's representative.
3. Conform to the following flowability test:
  - a. Fill a 3-inch diameter by 6-inch long open ended cylinder with the mixture, then strike off to level. Remove the cylinder by pulling straight up and ensure the diameter of the CLSM, after spreading, is a minimum of 8-inches.

D. Mixing and Transportation

1. Transport CLSM by mixer truck. Provide continuous agitation from mixing to placement.

E. Placement

1. Place CLSM directly from the truck chute or pump it. No additional compaction is required.

3.4 PREPARATION FOR TOPSOIL AND SEEDING

- A. Separately stockpile excavated topsoil adjacent to the trench and utilize it in the final stage of backfilling operation.
- B. Grade exposed earth and other erodible areas to a reasonably uniform, and satisfactory, cross section and slope, as soon as practicable.

END OF SECTION 260508



## SECTION 26 0519 - LOW-VOLTAGE POWER CONDUCTORS AND CABLES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.
- B. Install all wire in raceway unless specifically permitted otherwise hereafter in this section under other Division 26 sections or on electrical drawings.

#### 1.2 QUALITY ASSURANCE

- A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wires and cables according to NEMA WC 26.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Wires and Cables:
  - 1. Alcan Aluminum Corporation; Alcan Cable Div.
  - 2. American Insulated Wire Corp.; Leviton Manufacturing Co.
  - 3. BICC Brand-Rex Company.
  - 4. Carol Cable Co., Inc.
  - 5. Senator Wire & Cable Company.
  - 6. Southwire Company.
- C. Connectors for Wires and Cables:
  - 1. AMP Incorporated.
  - 2. General Signal; O-Z/Gedney Unit.
  - 3. Monogram Co.; AFC.
  - 4. Square D Co.; Anderson.
  - 5. 3M Company; Electrical Products Division.

## 2.2 GENERAL

- A. Provide wire and cable suitable for the temperature, conditions and location where installed.

## 2.3 CONDUCTORS

- A. Conductor material shall be copper for all wires and cables. Conductor sizes indicated are based on copper. Minimum conductor size shall be #12 AWG. Provide stranded conductors for all sizes unless indicated otherwise.
- B. Distances from panel to first outlet of a 15 or 20 amp branch circuit shall require the following minimum wire size to the first outlet. All branch circuits more than 100 feet in length shall be minimum No. 10 to the last outlet. Control circuits shall be No. 14 except for runs exceeding 300 feet where they shall be No. 12.

(1) Distance	AWG Wire Sizes
(2) Up to 100 feet	#12
(3) 100 to 200 feet	#10
(4) More than 200 feet	#8

- C. Color Coding for phase identification shall be in accordance with Division 26 Section "Common Work Results for Electrical." All conductor insulation shall be rated at 600V AC/90 deg. Provide XHHW insulation for all conductors size 250 kcmil (MCM) and larger. For all other sizes provide THW or THHN/THWN insulation as appropriate for the locations where installed.
- D. Provide XHHW insulation for all wiring below grade and/or for all wiring subject to moisture conditions.
- E. Provide dedicated parity sized neutral conductor for each branch circuit phase conductor that serves H.I.D. luminaires.
- F. Provide dedicated parity sized neutral conductor for each branch circuit phase conductor that serves receptacles.

## 2.4 TYPE AC/MC CABLES

- A. Type AC cable is not permitted for use on this project.
- B. Type MC Cables shall be 90 deg. C. rated with all components and fittings listed for grounding and compliant with the following.
  - 1. UL Std. 4 and UL Std. 83.
  - 2. ANSI E119 and E814.
  - 3. NEC Articles 250 and 333.

- C. Cables shall be formed from continuous length of spirally wound, interlocked zinc-coated or galvanized (inside & outside) strip steel. All conductors shall be rated for 90 deg. C. minimum. Provide with full size parity sized green insulated equipment ground conductor.
- D. Provide compatible steel fittings with integral red plastic insulated throat bushings, compliant with NEC 350-5.
- E. Type MC cable may be utilized only if NEC approved and if approved by local authority having jurisdiction and in the following applications defined below.
  - 1. Final connection to lighting fixtures that are installed in accessible tile ceiling systems.
  - 2. Wiring from fixture to fixture only above accessible ceilings.
  - 3. Behind drywall walls for connection of receptacles.
- F. Type MC cable may not be used behind drywall ceilings which are considered inaccessible.
- G. MC cable installed in both locations permitted by this section and areas subject to Article 517 requirements, health facilities type MC must be used.

#### 2.5 PORTABLE CORD (if required)

- A. Portable Cord shall be Type S. Provide with full parity sized insulated equipment ground conductor.
- B. Type S Portable Cord may be used for flexible pendant leads to outlets and equipment where indicated and only where NEC approved, where approved by local authority having jurisdiction and where prior approval is given by Engineer.

#### 2.6 CONNECTORS FOR CONDUCTORS

- A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

### PART 3 - EXECUTION

#### 3.1 GENERAL INSTALLATION

- A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Wires #6 AWG and larger shall be connected to panels and apparatus by means of approved lugs or connectors large enough to enclose all strands of the conductors. Connectors shall be of the solderless type. Solderless connectors shall be O.Z. Type XW or XTP of proper size

- and type required with Bakelite covers and stainless steel spring clips. Solderless lugs shall be O.Z. Type XL of proper size as required.
- C. No wire shall be pulled until raceways are complete, plastering is complete and raceways are free of moisture. Joints or splices shall be permitted only at NEC approved panels, junction boxes or accessible outlet boxes. Pull conductors simultaneously where more than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary. Use pulling means including, fish tape, cable, rope or basket weave wire/cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable. Conceal all work in finished spaces.
  - D. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."
  - E. Remove existing wires from raceway before pulling in new wires and cables.
  - F. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
  - G. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
  - H. Support cables according to Division 26 Section "Common Work Results for Electrical."
  - I. Seal around cables penetrating fire-rated elements according to Division 7 Section "Firestopping."
  - J. Identify wires and cables according to Division 26 Section "Common Work Results for Electrical."

### 3.2 FIELD QUALITY CONTROL

- A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
  - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
  - 2. Megger all branch circuits and feeders #6 and larger. Submit results to consulting engineer. Acceptable meg ohm readings shall be per NETA standards.
- B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 26 0519

## SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 26 Section 0519 "Low-Voltage Electrical Power Conductors and Cables" for requirements for grounding conductors.

#### 1.2 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for grounding rods, connectors and connection materials, and grounding fittings.

#### 1.3 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Erico Inc.; Electrical Products Group.
  - 2. Galvan Industries, Inc.
  - 3. Ideal Industries, Inc.
  - 4. ILSCO.
  - 5. O-Z/Gedney Co.
  - 6. Raco, Inc.
  - 7. Thomas & Betts, Electrical.

## 2.2 GROUNDING AND BONDING PRODUCTS

- A. Governing Requirements: Where types, sizes, ratings, and quantities indicated are in excess of National Electrical Code (NEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

## 2.3 WIRE AND CABLE GROUNDING CONDUCTORS

- A. Comply with Division 26 Section "Low-Voltage Electrical Power Conductors and Cables." Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
  - 1. Material: Copper. Use only copper wire for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
- B. Equipment Grounding Conductors: Insulated with green color insulation.
- C. Grounding-Electrode Conductors: Stranded cable.
- D. Underground Conductors: Bare, tinned, stranded, except as otherwise indicated.
- E. Bare Copper Conductors: Conform to the following:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Assembly of Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.

## 2.4 MISCELLANEOUS CONDUCTORS

- A. Grounding Bus: Bare, annealed-copper bars of rectangular cross section.
- B. Braided Bonding Jumpers: Copper tape, braided No. 30 AWG bare copper wire, terminated with copper ferrules.
- C. Bonding Straps: Soft copper, 0.05 inch (1 mm) thick and 2 inches (50 mm) wide, except as indicated.

## 2.5 CONNECTOR PRODUCTS

- A. Pressure Connectors: High-conductivity-plated units.
- B. Bolted Clamps: Heavy-duty type.
- C. Exothermic-Welded Connections: Provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.

## 2.6 GROUNDING ELECTRODES

- A. Grounding Rods: Sectional type; copper-clad steel.
  - 1. Size: 3/4 inch by 120 inches (19 by 3000 mm).

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
  - 1. Install equipment grounding conductor with circuit conductors for the items below in addition to those required by Code:
    - a. Feeders and branch circuits.
    - b. Lighting circuits.
    - c. Receptacle circuits.
    - d. Single-phase motor or appliance branch circuits.
    - e. Three-phase motor or appliance branch circuits.
    - f. Flexible raceway runs.
    - g. Metal-clad cable runs.
  - 2. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
- B. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide a No. 4 AWG minimum insulated grounding conductor in raceway from grounding-electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
  - 1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
  - 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- C. Separately Derived Systems: Where NEC requires grounding, ground according to NEC Paragraph 250-26.

### 3.2 INSTALLATION

- A. General: Ground electrical systems and equipment according to NEC requirements, except where Drawings or Specifications exceed NEC requirements.

- B. Grounding Rods: Locate a minimum of 1-rod length from each other and at least the same distance from any other grounding electrode.
  - 1. Drive until tops are 2 inches (50 mm) below finished floor or final grade, except as otherwise indicated.
  - 2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.
- C. Grounding Conductors: Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- D. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches (600 mm) below grade.
- E. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized as indicated, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Do not install a grounding jumper across dielectric fittings. Bond grounding-conductor conduit to conductor at each end.
- F. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.
- G. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

### 3.3 CONNECTIONS

- A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
  - 1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
  - 2. Make connections with clean, bare metal at points of contact.
  - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
  - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

- B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
- D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.
- E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and grounding rods.
- F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.
- G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
- H. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

### 3.5 ADJUSTING AND CLEANING

- A. Restore surface features, including vegetation, at areas disturbed by work of this Section. Reestablish original grades, except as otherwise indicated. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 2 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION 26 0526



## SECTION 26 0533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1. Raceways include the following:

- a. RMC.
- b. IMC.
- c. EMT.
- d. FMC.
- e. LFMC.
- f. RNC. (PVC)
- g. Wireways.
- h. Surface raceways.

2. Boxes, enclosures, and cabinets include the following:

- a. Device boxes.
- b. Outlet boxes.
- c. Pull and junction boxes.

B. Related Sections include the following:

1. Division 26 Section 0500 "Common Work Results for Electrical" for raceways and box supports.
2. Division 26 Section 2726 "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

#### 1.2 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.
- E. RMC: Rigid metal conduit.
- F. RNC: Rigid nonmetallic conduit. (PVC)

#### 1.3 SUBMITTALS

- A. Product Data: For raceways, fittings, boxes, and enclosures to be used.

#### 1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
- B. Comply with NECA's "Standard of Installation."

#### 1.5 COORDINATION

- A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Metal Conduit and Tubing:
    - a. Carol Cable Co., Inc.
    - b. Cole-Flex Corp.
    - c. Grinnell Co.; Allied Tube and Conduit Div.
    - d. Monogram Co.; AFC.
    - e. Triangle PWC, Inc.
    - f. Wheatland Tube Co.
  - 2. Nonmetallic Conduit and Tubing:
    - a. Cantex Industries; Harsco Corp.
    - b. Hubbell, Inc.; Raco, Inc.
    - c. Lamson & Sessions; Carlon Electrical Products.
    - d. Thomas & Betts Corp.
  - 3. Conduit Bodies and Fittings:
    - a. American Electric; Construction Materials Group.
    - b. Crouse-Hinds; Div. of Cooper Industries.
    - c. Emerson Electric Co.; Appleton Electric Co.
    - d. Hubbell, Inc.; Killark Electric Manufacturing Co.
    - e. Lamson & Sessions; Carlon Electrical Products.

- f. O-Z/Gedney; Unit of General Signal.
4. Metal Wireways:
- a. Hoffman Engineering Co.
  - b. Square D Co.
5. Surface Metal Raceways:
- a. American Electric; Construction Materials Group.
  - b. Butler Manufacturing Co.; Walker Division.
  - c. Wiremold Co. (The); Electrical Sales Division.
6. Surface Nonmetallic Raceways:
- a. Butler Manufacturing Co.; Walker Division.
  - b. Hubbell, Inc.; Wiring Device Division.
  - c. Lamson & Sessions; Carlon Electrical Products.
  - d. Panduit Corp.
  - e. Wiremold Co. (The); Electrical Sales Division.
7. Boxes, Enclosures, and Cabinets:
- a. American Electric; FL Industries.
  - b. Butler Manufacturing Co.; Walker Division.
  - c. Crouse-Hinds; Div. of Cooper Industries.
  - d. Electric Panelboard Co., Inc.
  - e. Erickson Electrical Equipment Co.
  - f. Hoffman Engineering Co.; Federal-Hoffman, Inc.
  - g. Hubbell Inc.; Killark Electric Manufacturing Co.
  - h. Hubbell Inc.; Racor, Inc.
  - i. Lamson & Sessions; Carlon Electrical Products.
  - j. O-Z/Gedney; Unit of General Signal.
  - k. Parker Electrical Manufacturing Co.
  - l. Robroy Industries, Inc.; Electrical Division.
  - m. Thomas & Betts Corp.
  - n. Woodhead Industries, Inc.; Daniel Woodhead Co.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 WIRING METHODS

A. Outdoors: Use the following wiring methods:

1. Exposed: IMC.
2. Underground: RNC(PVC Schedule 40) or IMC.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
4. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Indoors: Use the following wiring methods:

1. Exposed: EMT.
2. Concealed: EMT or MC (for receptacles)
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
4. Damp or Wet Locations: IMC.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
  - a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel.
  - b. Damp or Wet Locations: NEMA 250, Type 4, nonmetallic.
6. Connection to light fixtures: Type MC Cable may be used where permitted by code and in lengths no greater than 8'-0" (243 CM) above accessible ceilings.

### 3.3 INSTALLATION

- A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
- B. Minimum Raceway Size: 3/4-inch trade size (DN21).
- C. Conceal conduit and EMT, unless otherwise indicated, within finished walls, ceilings, and floors.
- D. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- E. Install raceways level and square and at proper elevations. Provide adequate headroom.
- F. Complete raceway installation before starting conductor installation.
- G. Support raceways as specified in Division 26 Section "Common Work Results for Electrical."
- H. Use temporary closures to prevent foreign matter from entering raceways.

- I. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- J. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- K. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
- L. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.
- M. Raceways Embedded in Slabs: Install in middle third of slab thickness where practical, and leave at least 1-inch (25-mm) concrete cover.
  - 1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
  - 2. Space raceways laterally to prevent voids in concrete.
  - 3. Run conduit larger than 1-inch trade size (DN27) parallel to or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
  - 4. Transition from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
- N. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.
  - 1. Run parallel or banked raceways together, on common supports where practical.
  - 2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- O. Join raceways with fittings designed and approved for the purpose and make joints tight.
  - 1. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
  - 2. Use insulating bushings to protect conductors.
- P. Tighten set screws of threadless fittings with suitable tools.
- Q. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.
- R. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used,

- align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
- S. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of the pull wire.
  - T. Telephone and Signal System Raceways, 2-Inch Trade Size (DN53) and Smaller: In addition to the above requirements, install raceways in maximum lengths of 150 feet (45 m) and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.
  - U. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
    - 1. Where conduits pass from warm to cold locations, such as the boundaries of refrigerated spaces.
    - 2. Where otherwise required by NFPA 70.
  - V. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded flush plugs flush with floor for future equipment connections.
  - W. Flexible Connections: Use maximum of 6 feet (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.
  - X. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in a nonmetallic sleeve.
  - Y. Do not install aluminum conduits embedded in or in contact with concrete.
  - Z. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying the raceways to receptacle or fixture ground terminals.
    - 1. Select each surface raceway outlet box, to which a lighting fixture is attached, of sufficient diameter to provide a seat for the fixture canopy.
    - 2. Where a surface raceway is used to supply a fluorescent lighting fixture having central-stem suspension with a backplate and a canopy (with or without extension ring), no separate outlet box is required.

3. Provide surface metal raceway outlet box, and the backplate and canopy, at the feed-in location of each fluorescent lighting fixture having end-stem suspension.
4. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, no additional surface-mounted outlet box is required. Provide a backplate slightly smaller than the fixture canopy.

#### 3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.
  1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

#### 3.5 CLEANING

- A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 26 0533



## SECTION 26 0553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

### 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. Power Raceway Identification Materials
  - 2. Armored & Metal-Clad Identification Materials
  - 3. Power & Control Cable Identification
  - 4. Warning Labels and Signs
  - 5. Instruction Signs

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

#### 1.4 SUBMITTALS

- A. Not used.

#### 1.5 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, all where applicable, shall comply with UL 969.

### PART 2 - PRODUCTS

#### 2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

- B. Colors for Raceways Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage and system or service type, panel and circuit numbers.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.
  - 1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer, or
  - 2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

## 2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Colors for Raceways Carrying Circuits at 600 V and Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage and system or service type, panel and circuit numbers.
- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label, or
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches (50 mm) wide; compounded for outdoor use.

## 2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

- C. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.
- D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

#### 2.4 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
  - 1. Engraved legend with black letters on white face.
  - 2. Punched or drilled for mechanical fasteners.
  - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

#### 2.5 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. inches (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
  - 1. Engraved legend with black letters on white face.
  - 2. Punched or drilled for mechanical fasteners.
  - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

### PART 3 - EXECUTION

#### 3.1 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 26 0553

PROJECT NO. 25033  
2A 17772

DAYTON SPLASH PADS

## SECTION 26 2416 - PANELBOARDS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.
- B. Related Sections include the following:
  - 1. Division 26 Section "Common Work Results for Electrical" for general materials and installation methods.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of panelboard, accessory item, and component specified.
- B. Shop Drawings: For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:
  - 1. Enclosure type with details for types other than NEMA 250, Type 1.
  - 2. Bus configuration and current ratings.
  - 3. Short-circuit current rating of panelboard.
  - 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
  - 5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.
- C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- D. Maintenance Data: For panelboard components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers.

#### 1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

#### 1.5 EXTRA MATERIALS

- A. Keys: 6 spares of each type for panelboard cabinet lock.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Eaton Corp.; Westinghouse & Cutler-Hammer Products.
  2. Siemens Energy & Automation, Inc.
  3. Square D Co.

### 2.2 PANELBOARD FABRICATION

- A. Enclosures: Flush- or surface-mounted cabinets as indicated. NEMA Type 1, unless otherwise indicated to meet environmental conditions at installed location.
1. Outdoor Locations: NEMA Type 3R.
  2. Kitchen Areas: NEMA Type 4X, stainless steel.
  3. Other Wet or Damp Indoor Locations: NEMA Type 4.
  4. Pump/filter room: NEMA 4X
- B. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. Fronts for flush panelboards shall overlap box, unless otherwise indicated.
- C. Directory Frame: Metal, mounted inside each panelboard door.
- D. Bus: Hard drawn copper of 98 percent conductivity.
- E. Main and Neutral Lugs: Compression type.
- F. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.
- G. Service Equipment Approval: If panel shown on drawings is shown to be used for Service Entrance, provide panel listed for use as service.
- H. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the overcurrent protective device ampere ratings indicated for future installation of devices.
- I. Feed-through Lugs: If single-line diagram and/or panel schedules indicate feed through lugs, size lugs to accommodate feeders indicated.

### 2.3 LOAD CENTERS

- A. Not permitted to be used.

## 2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Doors: In panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.

## 2.5 DISTRIBUTION PANELBOARDS

- A. Doors: In panelboard front, except omit in fusible-switch panelboard, unless otherwise indicated. Secure door with vault-type latch with tumbler lock, all keyed alike.
- B. Branch-Circuit Breakers: Where overcurrent protective devices are indicated to be circuit breakers, use bolt-on circuit breakers, except circuit breakers 225-A frame size and greater may be plug-in type where individual positive-locking device requires mechanical release for removal.

## 2.6 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.
  - 1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating to meet available fault current.
  - 2. Application Listing: Appropriate for application, including Type SWD for switching fluorescent lighting loads and Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.
  - 4. Circuit Breakers, 400 A and Larger: Field-adjustable LSI current settings.
  - 5. Current-Limiting Trips: Where indicated, let-through ratings less than NEMA FU 1, Class RK-5.
  - 6. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
  - 7. Shunt Trip: Where indicated.
- B. 41 circuit breakers for critical and essential critical system shall be selectively coordinated as required by NEC 700.27. Contractor shall submit to engineer coordination study from vendor to obtain approval of overcurrent device prior to ordering,

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install panelboards and accessory items according to NEMA PB 1.1.
- B. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.
- C. Mounting: Plumb and rigid without distortion of box. Mount flush panelboards uniformly flush with wall finish.

- D. Circuit Directory: Type directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing.
- E. Install filler plates in unused spaces.
- F. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.
- G. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties after completing load balancing.
- H. Contractor shall be responsible for coordinating installation of panelboards with general contractor. Electrical Contractor shall verify all walls which shall receive panelboards and make sure that walls are minimum 6" deep to accommodate panels. If walls are not able to accommodate depth Electrical Contractor shall relocate panel to walls which are satisfactory to receive 6" depth. No additional compensation will take place for coordination of panel depth and relocation to appropriate walls.
- I. Contractor shall verify prior to bidding that Loadcenter type construction is suitable for this project. Base bid shall include Panelboard type construction only unless specifically permitted by the Owner.

### 3.2 IDENTIFICATION

- A. Identify field-installed wiring and components and provide warning signs as specified in Division 26 Section " Common Work Results for Electrical."
- B. Panelboard Nameplates: Label each panelboard with engraved laminated-plastic or metal nameplates mounted with corrosion-resistant screws.

### 3.3 GROUNDING

- A. Make equipment grounding connections for panelboards as indicated.

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### 3.5 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:

1. Make insulation-resistance tests of each panelboard bus, component, and connecting supply, feeder, and control circuits.
  2. Make continuity tests of each circuit.
- B. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
  2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.
- C. Balancing Loads: After Substantial Completion, but not more than 2 months after Final Acceptance, conduct load-balancing measurements and make circuit changes as follows:
1. Perform measurements during period of normal working load as advised by Owner.
  2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility. Make special arrangements with Owner to avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
  3. Recheck loads after circuit changes during normal load period. Record all load readings before and after changes and submit test records.
  4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as required to meet this minimum requirement.

### 3.6 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION 26 2416



## SECTION 26 2726 - WIRING DEVICES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes various types of receptacles, connectors, switches, and finish plates. Verify color selection with Owner's representative.

#### 1.2 SUBMITTALS

- A. Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
  - 1. Product data for each product specified.
- B. Operation and maintenance data for materials and products specified in this Section to include in the "Operating and Maintenance Manual" specified in Division 1.

#### 1.3 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products that are listed and labeled for their applications and installation conditions and for the environments in which installed.
  - 1. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Switches: Leviton & Hubbell
  - 2. Dimmers: Lutron
  - 3. Occupany Sensor: Watt Stopper
  - 4. Receptacles: Leviton & Hubbell
  - 5. Wall Plates: Leviton & Hubbell
  - 6. Multi-Outlet Assemblies: Wiremold.

#### 2.2 SWITCHES

- A. Wall Switches
  - 1. Wall switches, in general shall be flush self-grounding with green ground screw and color coded cover, toggle type, back & side wired, specification grade, rated 20A, 120/277 volts, 1 HP at 120V, A.C quiet type. Locking type switches shall be same as below except with "L" suffix (provide six keys). Catalog numbers below are based on Leviton.

- a) Single pole, toggle: CSB1-20G
- b) Double-pole, toggle: CSB2-20G
- c) 3-way, toggle: CSB3-20G
- d) 4-way, toggle: CSB4-20G
- e) Double Pole, key lock: 1222-2KL

B. Occupancy Sensor Switches

- 1. Occupancy sensor lighting switches for individual room applications shall be Watt Stopper Inc. #WS-120 or WS-277 series as required. Install these sensors at standard switch heights and locations.
- 2. Occupancy sensor lighting switches for special applications shall be per the Electrical Legend on the drawings, with power packs, accessories, lenses, mounting, wiring and installation methods as recommended by manufacturer for a complete working installation.

2.3 RECEPTACLES

A. Standard Specification Grade Duplex/Single Receptacles

- 1. Provide duplex and single specification grade receptacles, 2-pole, 3-wire grounding, self-grounding, green grounding screw, ground terminals and poles internally connected to mounting yoke, color coded base, 15-amp and 20-amp, 125-volts, with metal plaster ears, back & side wiring, NEMA configuration 5-15R or 5-20R.
- 2. Duplex receptacles shall be as listed below.
  - a) Duplex Receptacle: CR15-GY, CR20-GY
    - a. Color: Gray
  - b) Tamper Resistant: 8200-SGG
    - a. Color: Gray
  - c) Receptacles wired on emergency power shall be red.

B. Ground-Fault Interrupter Specification Grade Receptacles

- 1. Provide self grounding commercial specification grade, duplex receptacles, ground-fault circuit interrupters; feed-thru type, capable of protecting connected downstream receptacles on single circuit, grounding type UL-rated 943, Class A, Group 1, specification grade, 20-amperes rating (device & feed-thru), 125-volts, 60 Hz; with solid-state ground-fault sensing and signaling (maximum threshold of 5 mA at .025 seconds maximum); equip with 20-ampere plug configuration, NEMA 5-20R. Design units for installation in a 2-3/4-inch (70-mm) deep outlet box without an adapter.
- 2. Ground fault circuit interrupter duplex receptacles shall be Leviton # 7599-G series.
- 3. Where GFI protected receptacles are shown on the drawings, provide a separate GFI receptacle for each one shown. Do not feed downstream receptacles from load-side (GFI-protected) terminals of upstream receptacles.

C. Weatherproof cover for exterior receptacle: Leviton 5977-GY

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install devices and assemblies plumb and secure.
- B. Install wall plates when painting is complete.
- C. Arrangement of Devices: Except as otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- D. Protect devices and assemblies during painting.
- E. Adjust locations at which floor service outlets and telephone/power service poles are installed to suit the indicated arrangement of partitions and furnishings.
- F. Exterior outlets: All exterior outlets shall be of the Ground-Fault Circuit Interrupter (GFCI) Type whether or not they are indicated as such on the drawings. Exterior outlets shall also be provided with a weatherproof cover that is UL listed.

#### 3.2 GROUNDING

- A. Isolated Ground Receptacles: Connect to isolated grounding conductor routed to designated isolated equipment ground terminal of electrical system.

#### 3.3 FIELD QUALITY CONTROL

- A. Testing: Test wiring devices for proper polarity and ground continuity.
- B. Test ground-fault circuit interrupter operation with both local and remote fault simulations according to manufacturer recommendations.
- C. Replace damaged or defective components.
- D. Cord and Plug Sets: Match voltage and current ratings and number of conductors to requirements of the equipment being connected.
- E. Cord: Rubber-insulated, stranded copper conductors, with type SOW-A jacket. Grounding conductor has green insulation. Ampacity is equipment rating plus 30 percent minimum.
- F. Dimmers:
  - 1. Wattage rating exceeds connected load by 30 percent minimum, except as otherwise indicated.
  - 2. Control: Continuously adjustable slide. Single-pole or 3-way switch to suit connections.

- 3.4 Wall Plates: Single and combination types that mate and match with corresponding wiring devices. Features include the following:

- A. Color: Stainless Steel.
  - B. Plate-Securing Screws: Metal with heads colored to match plate finish.
  - C. Material for Unfinished Spaces: Stainless Steel
  - D. CLEANING
- 3.5 General: Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 26 2726

## SECTION 26 2816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes individually mounted switches and circuit breakers used for the following:
  - 1. Service disconnect switches.
  - 2. Feeder and equipment disconnect switches.
  - 3. Feeder branch-circuit protection.
  - 4. Motor disconnect switches.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 26 Section "Fuses" for fuses in fusible disconnect switches.

#### 1.2 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for disconnect switches, circuit breakers, and accessories specified in this Section.

#### 1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain disconnect switches and circuit breakers from one source and by a single manufacturer. These devices shall also be the same source as the panelboards.
- B. Comply with NFPA 70 for components and installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- B. Manufacturers: Subject to compliance with requirements, provide disconnect switches and circuit breakers by one of the following:
  - 1. Fusible Switches:
    - a. Siemens Energy & Automation, Inc.
    - b. Square D Co.
    - c. Cutler Hammer
  - 2. Molded-Case Circuit Breakers:

- a. Siemens Energy & Automation, Inc.
- b. Square D Co.
- c. Cutler Hammer

## 2.2 DISCONNECT SWITCHES

- A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle.
- B. Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, clips to accommodate specified fuses, enclosure consistent with environment where located, handle lockable with 2 padlocks, and interlocked with cover in CLOSED position.
- C. Enclosure: NEMA KS 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.
  1. Outdoor Locations: Type 3R.
  2. Kitchen Areas: Type 4X, stainless steel.
  3. Pool Pump/Filter Room: Type 4X, stainless steel

## 2.3 ENCLOSED CIRCUIT BREAKERS

- A. Enclosed, Molded-Case Circuit Breaker: NEMA AB 1, with lockable handle.
- B. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting rating to meet available fault current.
- C. Application Listing: Appropriate for application, including switching fluorescent lighting loads or heating, air-conditioning, and refrigerating equipment.
- D. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.
- E. Circuit Breakers, 400 A and Larger: Field-adjustable, LSI current settings.
- F. Current-Limiting Trips: Where indicated, let-through ratings less than NEMA FU 1, Class RK-5.
- G. Current Limiters: Where indicated, integral fuse listed for circuit breaker.
- H. Molded-Case Switch: Where indicated, molded-case circuit breaker without trip units.
- I. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
- J. Shunt Trip: Where indicated.
- K. Accessories: As indicated.

- L. Enclosure: NEMA AB 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.
  - 1. Outdoor Locations: Type 3R.
  - 2. Kitchen Areas: Type 4X, stainless steel.
  - 3. Other Wet or Damp Indoor Locations: Type 4.
  - 4. Hazardous Areas Indicated on Drawings: Type 7C.
  - 5. Pool Pump/Filter Room: Type 4X, stainless steel

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install disconnect switches and circuit breakers in locations as indicated, according to manufacturer's written instructions.
- B. Install disconnect switches and circuit breakers level and plumb.
- C. Compare disconnect rating shown on drawing with that required by the actual nameplate data of equipment purchased. Contractor is responsible for installing correct disconnect required by National Electrical Code. No additional compensation will be provided to provide a disconnect which is rated different than what is shown on the drawings.
- C. Connect disconnect switches and circuit breakers and components to wiring system and to ground as indicated and instructed by manufacturer.
  - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- D. Identify each disconnect switch and circuit breaker according to requirements specified in Division 26 Section "Common Work Results for Electrical."

#### 3.2 FIELD QUALITY CONTROL

- A. Testing: After installing disconnect switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
  - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for disconnect switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
- B. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

#### 3.3 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION 26 2816

SECTION 264313 – SURGE PROTECTION DEVICES FOR LOW-VOLTAGE ELECTRICAL  
POWER CIRCUITS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes requirements for Surge Protection Devices (SPD) for the power distribution system. If terms such as TVSS or transient voltage surge suppression are indicated elsewhere in Division 26 documents, they shall be taken to mean SPD. Specific SPD related work may not be indicated on drawings. Work indicated hereafter is intended to schematically define related work. Provide complete SPD systems as define in this section and as shown on drawings. Refer to drawings for equipment, component, device, and assembly locations, layouts, current rating requirements, voltage/phase requirements, and other relevant details.

1.2 SUBMITTALS

- A. Submit manufacturer's SPD data. Include tabulation of system features and performance characteristics. If equipment other than the basis of design is proposed, include in tabulation line by line comparison of data for the proposed equipment to the specified equipment. Provide characteristics that meet or exceed those specified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide surge protection devices of one of the following.
  - 1. Current Technologies.
  - 2. Liebert.
- B. Provide products compliant with the following.
  - 1. Underwriter's Laboratory UL Standard 1449 latest Edition Listed.
  - 2. CUL latest edition Listed.
  - 3. NEMA LS-1 latest edition compliant.
  - 4. ANSI/IEEE C62.41/62.45 latest edition compliant.
  - 5. MIL Standard 220A compliant.
  - 6. NFPA 780 and UL 96a for lightning protection systems
  - 7. Motorola R56 compliant, most stringent shall apply
- C. Protection and Filtering Elements
  - 1. Test the SPD device repetitive surge current capacity utilizing a 1.2x50 microseconds

20kV open circuit voltage, and 8x20 microseconds 10kA short circuit Category C3 test waveform (as defined by ANSI/IEEE C62.41-1991 and ANSI/IEEE C62.45-1992) at one

minute intervals. Define a failure as either performance degradation, or more than 10% deviation of clamping voltage, at the specified surge current.

2. Base maximum surge current ratings on testing of a complete SPD unit including fuses and components that make up the SPD system. Do not devices a maximum surge current rating by adding test results of individual components.
  3. Provide fusing system capable of allowing the rated maximum surge current to pass through without fuse operation. Do not provide systems utilizing a fusing system that opens below the maximum surge current level. Provide fusing system with thermal fuses and surge rated fuses, and include them in the surge current testing.
  4. Do not provide systems using gas tubes, silicon avalanche diodes, selenium rectifiers, or printed circuit board technology in surge current path.
  5. Provide maximum Continuous Operating Voltage (MCOV) for each voltage configurations at 115 percent of nominal.
- D. Provide SPD materials and components that comply with manufacturer's standard design, in accordance with published product information.
- E. Provide equipment equal to compliant products offered by G.E., Square D, Eaton, Advanced Protection Technologies (APT), Siemens Sentron TPS, Liebert, LEA, Current Technology, United Power, and Leviton. Provide SPD units with the following features.
1. LED Status lights.
  2. Remote monitor contacts.
  3. Seven Mode device.
  4. Third-party tested.
  5. Compliance with UL 1449 2<sup>nd</sup> Edition.
  6. Compliance with NEMA LS-1, 1992.
  7. Compliance with ANSI/IEEE 62.41 and ANSI/IEEE 62.45.

## 2.2 SURGE PROTECTION DEVICES (SPD)

- A. High Exposure Units (at Service Entrance Switchboards/Distribution Panels – MDP & GSDB)
1. Provide high exposure units for service entrance switchboard and distribution panel applications. Provide units equal to G.E. Tranquell HE Series, including the following additional features.
    - a. Rate at minimum 150kA per mode (equal to 300kA per phase).
    - b. Provide integrated non-fused disconnect, tested to maximum surge current rating of device (with ability to remove unit without shutting down board).
    - c. Provide audible alarm.
    - d. Provide alarm indicating light.
    - e. Provide alarm silence and test switch.
    - f. Provide surge counter with battery backup and field sensitivity.
    - g. Comply with UL 1283, EMI/RFI noise filtering with -40dB voltage attenuation at 100 kHz, per NEMA LS-1/MIL 220A.

2. Test Suppression Voltage Rating (SVR) with the integral disconnect in accordance with UL-1449, Second Edition. Provide unit with SVR values not exceeding the following (including SPD disconnect).

<u>Nominal Voltage Configuration</u>	<u>L-N</u>	<u>N-G</u>	<u>L-G</u>	<u>L-L</u>
120/208 Grounded Wye	400	400	400	700

B. Medium Exposure Units (at Intermediate Distribution Panels – CSDP, URRP1, RPP1, RPP2, RPP3, MRPP1 & Equipment Room Busway)

1. Provide medium exposure units for intermediate distribution panels, and for general use panelboards that function as intermediate distribution panels. Provide units equal to G.E. Tranquell ME Series, including the following additional features.
  - a. Rate at minimum 100kA per mode, equal to 200kA per phase.
  - b. Comply with UL 1283.
2. Test Suppression Voltage Rating (SVR) with the integral disconnect in accordance with UL-1449, Second Edition. Provide units with SVR values not exceeding the following (including SPD disconnect).

<u>Nominal Voltage Configuration</u>	<u>L-N</u>	<u>N-G</u>	<u>L-G</u>	<u>L-L</u>
120/240 Grounded Neutral	400	400	400	700
120/208 Grounded Wye	400	400	400	700
277/480 Grounded Wye	800	800	800	1500
240 Delta				700 700
480 Delta				1500 1500

C. Low Exposure Units (at end-use general use Panelboards)

1. Provide low exposure units for end-use general use panelboards. Provide units equal to G.E. Tranquell LE Series, including the following additional features.
  - a. Rated at minimum 50kA per mode (equal to 100kA per phase).

D. Enclosures

1. SPDs shall be installed to a disconnecting switch or breaker rated for (minimum) 30-amps in the panel per manufacturer’s installation instructions to ensure a means of disconnecting the SPD from the service without de-energizing the panel or the connected loads. The use of direct bus bar connected SPDs is expressly prohibited and will be rejected.
2. Provide externally mounted units. Do not splice leads where SPD units are provided with factory installed box connector fitting with factory leads. Install conductors with direct paths to and from SPD devices avoiding sharp bends, loops and excessive lengths. Install SPD components to the panelboard boxes as near as possible to the interior connection points; position the related branch breakers accordingly. Cut factory and field leads as required to minimize cable lengths.

PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Provide materials and related work compliant with latest edition of the National Electrical Code (NEC).
- B. Unless otherwise indicated on drawings, provide one appropriately rated SPD unit for each service, distribution and branch panel. Where panelboards are installed side by side, and connected to each other via sub-feed (or feed-through) lugs from a common feeder, provide only one SPD unit for the pair or group as applicable. Provide wiring in strict accordance with manufacturer's recommendations.
- C. Coordinate with field conditions as necessary to interface installation of SPD.

END OF SECTION 264313



## SECTION 312000 - EARTH MOVING

### PART 1 - GENERAL

#### 1.1 GEOTECHNICAL REPORT.

- A. A geotechnical report, can be found in Division 00 of this Project manual. The report is provided for informational purposes only to aid in the understanding of the subsurface site conditions and is not to be considered part of the contract documents for this project.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Preparing subgrades for pavements, turf and grasses and plants.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Drainage course for concrete slabs-on-grade.
  - 4. Subbase course for concrete pavements.
  - 5. Subbase course and base course for asphalt paving.
  - 6. Excavating and backfilling for utility trenches.

#### 1.3 DEFINITIONS

- A. Backfill: Soil material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil borrowed from on-site locations for use as fill or backfill. Source location is in the area of the future soccer complex. All excavation done in borrow areas must be performed in a manner that benefits future construction and development of those areas. Contractor to coordinate operations with Owners representative.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional

excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 PROJECT CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

### PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

## 2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

### 3.2 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil

materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

### 3.3 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
  1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

### 3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
  1. Clearance: As indicated in drawings.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
  1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.
- D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

### 3.6 SUBGRADE INSPECTION

- A. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

### 3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
  1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

### 3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings.
- D. Trenches under Roadways: Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely

encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course.

- E. Place and compact initial backfill free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use engineered fill.
  - 4. Under building slabs, use engineered fill.
  - 5. Under footings and foundations, use engineered fill.

### 3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 or ASTM D 1557:
  - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 100 percent.
  - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
  - 3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
  - 4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

### 3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.
  - 3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

### 3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
  - 1. Shape subbase course and base course to required crown elevations and cross-slope grades.
  - 2. Place subbase course and base course that exceeds 4 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 4 inches thick or less than 3 inches thick.
  - 3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698 or ASTM D 1557.

### 3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.

- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
  - 1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 98 percent of maximum dry unit weight according to ASTM D 698.

### 3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

### 3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

## SECTION 312319 - DEWATERING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes construction dewatering.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

#### 1.3 ACTION SUBMITTALS

- A. Shop Drawings: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, discharge lines, piezometers, and flow-measuring devices; and means of discharge, control of sediment, and disposal of water.
- B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Preinstallation Conference: Conduct conference at Project site.

#### 1.5 PROJECT CONDITIONS

- A. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
  - 1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide temporary grading to facilitate dewatering and control of surface water.
- B. Monitor dewatering systems continuously.
- C. Protect and maintain temporary erosion and sedimentation controls, which are specified during dewatering operations.
- D. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
  - 1. Space well points or wells at intervals required to provide sufficient dewatering.
  - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- E. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- F. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- G. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.
- H. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
  - 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

END OF SECTION 312319

## SECTION 321313 - CONCRETE PAVING

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes Concrete Paving
  - 1. Driveways.
  - 2. Roadways.
  - 3. Parking lots.
  - 4. Curbs and gutters.
  - 5. Walks.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For each exposed product and for each color and texture specified.
- C. Other Action Submittals:
  - 1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

#### 1.3 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301 unless otherwise indicated.

### PART 2 - PRODUCTS

#### 2.1 STEEL REINFORCEMENT

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

- D. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- E. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- F. Deformed-Steel Wire: ASTM A 496/A 496M.
- G. Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.
- H. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

## 2.2 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
  - 1. Portland Cement: ASTM C 150, white portland cement Type I.
    - a. Fly Ash: ASTM C 618, Class C or Class F.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.
- C. Water: Potable and complying with ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

## 2.3 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

- F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

## 2.4 RELATED MATERIALS

- A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

## 2.5 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:
  1. Compressive Strength (28 Days): 4000 psi.
  2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
  3. Slump Limit: 3 inches, plus or minus 1 inch.
  4. Air Content: 5-1/2 percent plus or minus 1.5 percent.
- B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

## 2.6 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

## PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION

- A. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

### 3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

### 3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness:
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

### 3.5 CONCRETE PLACEMENT

- A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
- B. Comply with ACI 301 requirements for measuring, mixing, transporting, placing, and consolidating concrete.
- C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- D. Screed paving surface with a straightedge and strike off.
- E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

### 3.6 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Rfloat surface immediately to uniform granular texture.
  - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

### 3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these.

### 3.8 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
  1. Elevation: 3/4 inch.
  2. Thickness: Plus 3/8 inch, minus 1/4 inch.
  3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/2 inch.
  4. Joint Spacing: 3 inches.
  5. Contraction Joint Depth: Plus 1/4 inch, no minus.
  6. Joint Width: Plus 1/8 inch, no minus.

### 3.9 PAVEMENT MARKING

- A. Allow concrete paving to cure for a minimum of 28 days and be dry before starting pavement marking.
- B. Sweep and clean surface to eliminate loose material and dust.
- C. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

### 3.10 WHEEL STOPS

- A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.

- B. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

### 3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.
- B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

## SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Cold-applied joint sealants.

#### 1.2 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, eight, Samples of materials that will contact or affect joint sealants. Use manufacturer's standard test method to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Pavement-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.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Preconstruction compatibility and adhesion test reports.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Compatibility: Provide joint sealants, backing materials, 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.

## 2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Crafcro Inc., an ERGON company; RoadSaver Silicone SL.
- b. Dow Corning Corporation; 890-SL.
- c. Pecora Corporation; 300 SL.

## 2.3 JOINT-SEALANT BACKER MATERIALS

- A. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- B. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Cleaning of Joints: Clean out joints immediately before installing joint sealants.
- C. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- D. Install joint-sealant backings of kind indicated to support joint 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 joint-sealant backings.
  - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
  - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place joint 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 Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements 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 joint sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- G. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.
- H. Clean off excess joint 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.

END OF SECTION 321373



## SECTION 329200 - TURF AND GRASSES

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Seeding.

#### 1.2 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Whatever soil is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Certification of grass seed.
  - 1. Certification of each seed mixture for turfgrass sod.
- B. Product certificates.

1.5 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  - 1. Pesticide Applicator: State licensed, commercial.
- B. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory.
  - 1. The soil-testing laboratory shall oversee soil sampling.
  - 2. Report suitability of tested soil for turf growth.
    - a. State recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    - b. Report presence of problem salts, minerals, or heavy metals; if present, provide additional recommendations for corrective action.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

1.7 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
  - 1. Seeded Turf: 60 days from date of planting completion.
    - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

## PART 2 - PRODUCTS

### 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: State-certified seed of grass species as follows:
  - a. 29.49 percent GreensKeeper – WAF tall fescue.
  - b. 29.38 percent Tar Heel 2 tall fescue.
  - c. 20.78 percent Coyote II tall fescue.
  - d. 6.79 percent Raven Kentucky Bluegrass.
  - e. 6.75 percent Thermal Kentucky Bluegrass.
  - f. 6.30 percent Avalanche Kentucky Bluegrass.

### 2.2 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
  - 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
  - 2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.
- G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
- H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

### 2.3 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.
- B. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.
- C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

### 2.4 FERTILIZERS

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
  - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

### 2.5 PLANTING SOILS

- A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 2 percent organic material content. Existing, native surface topsoil. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix soil with the following soil amendments in the following quantities to produce planting soil:
  - 1. Ratio of Loose Compost to Topsoil by Volume: 1:4.

2.6 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

2.7 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 SEEDING

- A. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 3 to 4 lb/1000 sq. ft..
- C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas unless covered by erosion control blanket, by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

END OF SECTION 329200



## SECTION 330500 - COMMON WORK RESULTS FOR UTILITIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Piping joining materials.
  - 2. Dielectric fittings.
  - 3. Sleeves.
  - 4. Identification devices.
  - 5. Grout.
  - 6. Piping system common requirements.
  - 7. Equipment installation common requirements.
  - 8. Concrete bases.
  - 9. Metal supports and anchorages.

#### 1.2 DEFINITIONS

- A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.
- B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Dielectric fittings.
  - 2. Identification devices.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

#### 1.5 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Steel Piping Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

## PART 2 - PRODUCTS

### 2.1 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
1. ASME B16.21, nonmetallic, flat, asbestos free, 1/8-inch maximum thickness, unless otherwise indicated.
    - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
    - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
  2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- B. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAgl, silver alloy for refrigerant piping, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- G. Solvent Cements for Joining Plastic Piping:
1. ABS Piping: ASTM D 2235.
  2. CPVC Piping: ASTM F 493.
  3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  4. PVC to ABS Piping Transition: ASTM D 3138.
- H. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

## 2.2 DIELECTRIC FITTINGS

- A. Dielectric Fittings, General: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.
- B. Dielectric Unions:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Capitol Manufacturing Co.
    - b. Central Plastics Company.
    - c. Epcos Sales, Inc.
    - d. Hart Industries, International, Inc.
    - e. Watts Water Technologies, Inc.
    - f. Zurn Plumbing Products Group; Wilkins Div.
  3. Description: Factory fabricated, union, NPS 2 and smaller.
    - a. Pressure Rating: 250 psig at 180 deg F.
    - b. End Connections: Solder-joint copper alloy and threaded ferrous; threaded ferrous.
- C. Dielectric Flanges:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Capitol Manufacturing Co.
    - b. Central Plastics Company.
    - c. Epcos Sales, Inc.
    - d. Watts Water Technologies, Inc.
  3. Description: Factory-fabricated, bolted, companion-flange assembly, NPS 2-1/2 to NPS 4 and larger.
    - a. Pressure Rating: 175 psig minimum.
    - b. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric Couplings:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Calpico, Inc.
  - b. Lochinvar Corporation.
3. Description: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining, NPS 3 and smaller.
  - a. Pressure Rating: 300 psig at 225 deg F.
  - b. End Connections: Threaded.

E. Dielectric Nipples:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Perfection Corporation.
  - b. Precision Plumbing Products, Inc.
  - c. Victaulic Company.
3. Description: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining.
  - a. Pressure Rating: 300 psig at 225 deg F.
  - b. End Connections: Threaded or grooved.

2.3 SLEEVES

- A. Mechanical sleeve seals for pipe penetrations are specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
- B. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- C. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized, plain ends.
- D. Cast-Iron Sleeves: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- E. Molded PVC Sleeves: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe Sleeves: ASTM D 1785, Schedule 40.
- G. Molded PE Sleeves: Reusable, PE, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

## 2.4 IDENTIFICATION DEVICES

- A. Equipment Nameplates: Metal permanently fastened to equipment with data engraved or stamped.
  - 1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and essential data.
  - 2. Location: Accessible and visible.
- B. Snap-on Plastic Pipe Markers: Manufacturer's standard preprinted, semirigid, snap-on type. Include color-coding according to ASME A13.1, unless otherwise indicated.
- C. Pressure-Sensitive Pipe Markers: Manufacturer's standard preprinted, color-coded, pressure-sensitive-vinyl type with permanent adhesive.
- D. Pipes with OD, Including Insulation, Less Than 6 Inches: Full-band pipe markers, extending 360 degrees around pipe at each location.
- E. Pipes with OD, Including Insulation, 6 Inches and Larger: Either full-band or strip-type pipe markers, at least three times letter height and of length required for label.
- F. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length.
  - 1. Arrows: Either integrally with piping system service lettering to accommodate both directions of flow, or as separate unit on each pipe marker to indicate direction of flow.
- G. Plastic Tape: Manufacturer's standard color-coded, pressure-sensitive, self-adhesive vinyl tape, at least 3 mils thick.
  - 1. Width: 1-1/2 inches on pipes with OD, including insulation, less than 6 inches; 2-1/2 inches for larger pipes.
  - 2. Color: Comply with ASME A13.1, unless otherwise indicated.
- H. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch sequenced numbers. Include 5/32-inch hole for fastener.
  - 1. Material: 0.032-inch- thick, polished brass or aluminum.
  - 2. Material: 0.0375-inch- thick stainless steel.
  - 3. Material: 3/32-inch- thick plastic laminate with 2 black surfaces and a white inner layer.
  - 4. Material: Valve manufacturer's standard solid plastic.
  - 5. Size: 1-1/2 inches in diameter, unless otherwise indicated.
  - 6. Shape: As indicated for each piping system.
- I. Valve Tag Fasteners: Brass, wire-link or beaded chain; or brass S-hooks.
- J. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.

1. Engraving: Engraver's standard letter style, of sizes and with terms to match equipment identification.
  2. Thickness: 1/8 inch, unless otherwise indicated.
  3. Thickness: 1/16 inch, for units up to 20 sq. in. or 8 inches in length, and 1/8 inch for larger units.
  4. Fasteners: Self-tapping, stainless-steel screws or contact-type permanent adhesive.
- K. Plastic Equipment Markers: Manufacturer's standard laminated plastic, in the following color codes:
1. Green: Cooling equipment and components.
  2. Yellow: Heating equipment and components.
  3. Brown: Energy reclamation equipment and components.
  4. Blue: Equipment and components that do not meet criteria above.
  5. Hazardous Equipment: Use colors and designs recommended by ASME A13.1.
  6. Terminology: Match schedules as closely as possible. Include the following:
    - a. Name and plan number.
    - b. Equipment service.
    - c. Design capacity.
    - d. Other design parameters such as pressure drop, entering and leaving conditions, and speed.
  7. Size: 2-1/2 by 4 inches for control devices, dampers, and valves; 4-1/2 by 6 inches for equipment.

## 2.5 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
1. Characteristics: Post hardening, volume adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  2. Design Mix: 5000-psi, 28-day compressive strength.
  3. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 DIELECTRIC FITTING APPLICATIONS

- A. Dry Piping Systems: Connect piping of dissimilar metals with the following:
1. NPS 2 and Smaller: Dielectric unions.
  2. NPS 2-1/2 and Larger: Dielectric flanges.
- B. Wet Piping Systems: Connect piping of dissimilar metals with the following:
1. NPS 2 and Smaller: Dielectric couplings or dielectric nipples.
  2. NPS 2-1/2 and Larger: Dielectric nipples.

### 3.2 PIPING INSTALLATION

- A. Install piping according to the following requirements and utilities Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on the Coordination Drawings.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping to permit valve servicing.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Select system components with pressure rating equal to or greater than system operating pressure.
- I. Sleeves are not required for core-drilled holes.
- J. Permanent sleeves are not required for holes formed by removable PE sleeves.
- K. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
  - 1. Cut sleeves to length for mounting flush with both surfaces.
    - a. Exception: Extend sleeves installed in floors of equipment areas or other wet areas 2 inches above finished floor level.
  - 2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
    - a. **[PVC] [Steel]** Pipe Sleeves: For pipes smaller than NPS 6.
    - b. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.
- L. Verify final equipment locations for roughing-in.
- M. Refer to equipment specifications in other Sections for roughing-in requirements.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and utilities Sections specifying piping systems.

- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- E. Welded Joints: Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- F. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- G. Grooved Joints: Assemble joints with grooved-end pipe coupling with coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- H. Soldered Joints: Apply ASTM B 813 water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy (0.20 percent maximum lead content) complying with ASTM B 32.
- I. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- J. Pressure-Sealed Joints: Assemble joints for plain-end copper tube and mechanical pressure seal fitting with proprietary crimping tool to according to fitting manufacturer's written instructions.
- K. Plastic Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 appendixes.
  - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  - 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
  - 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- L. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- M. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

- N. Plastic Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
  - 1. Plain-End PE Pipe and Fittings: Use butt fusion.
  - 2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.
- O. Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

### 3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
  - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
  - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
  - 3. Install dielectric fittings at connections of dissimilar metal pipes.

### 3.5 EQUIPMENT INSTALLATION

- A. Install equipment level and plumb, unless otherwise indicated.
- B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations. Extend grease fittings to an accessible location.
- C. Install equipment to allow right of way to piping systems installed at required slope.

### 3.6 IDENTIFICATION

- A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.
  - 1. Plastic markers, with application systems. Install on insulation segment if required for hot noninsulated piping.
  - 2. Locate pipe markers on exposed piping according to the following:
    - a. Near each valve and control device.
    - b. Near each branch, excluding short takeoffs for equipment and terminal units. Mark each pipe at branch if flow pattern is not obvious.
    - c. Near locations where pipes pass through walls or floors or enter inaccessible enclosures.
    - d. At manholes and similar access points that permit view of concealed piping.
    - e. Near major equipment items and other points of origination and termination.
- B. Equipment: Install engraved plastic-laminate sign or equipment marker on or near each major item of equipment.

1. Lettering Size: Minimum 1/4 inch high for name of unit if viewing distance is less than 24 inches, 1/2 inch high for distances up to 72 inches, and proportionately larger lettering for greater distances. Provide secondary lettering two-thirds to three-fourths of size of principal lettering.
  2. Text of Signs: Provide name of identified unit. Include text to distinguish among multiple units, inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- C. Adjusting: Relocate identifying devices that become visually blocked by work of this or other Divisions.

### 3.7 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
  2. 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 base.
  3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
  4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  5. Install anchor bolts to elevations required for proper attachment to supported equipment.
  6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
  7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Section 033000 "Cast-in-Place Concrete."

### 3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Section 055000 "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor piped utility materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.9 GROUTING

- A. Mix and install grout for equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.

- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 330500



## SECTION 334100 - STORM UTILITY DRAINAGE PIPING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Pipe and fittings.
2. Manholes.
3. Cleanouts.
4. Nonpressure transition couplings.
5. Catch basins.
6. Stormwater inlets.

#### 1.2 ACTION SUBMITTALS

- ##### A. Product Data: For each type of product indicated.

#### 1.3 INFORMATIONAL SUBMITTALS

- ##### A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- ##### B. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- ##### C. Field quality-control reports.

#### 1.4 PROJECT CONDITIONS

- ##### A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
1. Notify Owner no fewer than two days in advance of proposed interruption of service.
  2. Do not proceed with interruption of service without Owner's written permission.

### PART 2 - PRODUCTS

#### 2.1 PE PIPE AND FITTINGS

- ##### A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
  2. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.
- B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.
1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
  2. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

## 2.2 CONCRETE PIPE AND FITTINGS

- A. Nonreinforced-Concrete Sewer Pipe and Fittings: ASTM C 14, Class 3, with tongue-and-groove ends and gasketed joints with ASTM C 443, rubber gaskets.
- B. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.
1. Tongue-and-groove ends and gasketed joints with ASTM C 443, rubber gaskets

## 2.3 CLEANOUTS

- A. Cast-Iron Cleanouts:
1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
  2. Top-Loading Classification(s): Light Duty, Medium Duty, Heavy Duty, and Extra-Heavy Duty.
  3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

## 2.4 MANHOLES

- A. Standard Precast Concrete Manholes:
1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
  2. Diameter: 48 inches minimum unless otherwise indicated.
  3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
  4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
  5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
  6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
  7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.

8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: Individual FRP steps or FRP ladder, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
10. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch- minimum width flange and 26-inch- diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."
2. Material: ASTM A 536, Grade 60-40-18 ductile iron unless otherwise indicated.

2.5 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
  - a. Invert Slope: 2 percent through manhole.
2. Benches: Concrete, sloped to drain into channel.
  - a. Slope: 8 percent.

- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

## 2.6 CATCH BASINS

### A. Standard Precast Concrete Catch Basins:

- 1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
- 2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
- 3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
- 4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
- 5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
- 6. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and shape matching catch basin frame and grate. Include sealant recommended by ring manufacturer.
- 7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and grate.
- 8. Steps: Individual FRP steps or FRP ladder, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than 60 inches.
- 9. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

### B. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include flat grate with small square or short-slotted drainage openings.

- 1. Size: 24 by 24 inches minimum unless otherwise indicated.
- 2. Grate Free Area: Approximately 50 percent unless otherwise indicated.

### C. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch- diameter flat grate with small square or short-slotted drainage openings.

- 1. Grate Free Area: Approximately 50 percent unless otherwise indicated.

## 2.7 STORMWATER INLETS

### A. Curb Inlets: Made with vertical curb opening, of materials and dimensions according to utility standards.

- B. Gutter Inlets: Made with horizontal gutter opening, of materials and dimensions according to utility standards. Include heavy-duty frames and grates.
- C. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions according to utility standards. Include heavy-duty frames and grates.
- D. Frames and Grates: Heavy duty, according to utility standards.

### PART 3 - EXECUTION

#### 3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

#### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow.
  - 2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
  - 3. Install piping with 36-inch minimum cover.
  - 4. Install PE corrugated sewer piping according to ASTM D 2321.
  - 5. Install nonreinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."
  - 6. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

### 3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following:
  - 1. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
  - 2. Join nonreinforced-concrete sewer piping according to ASTM C 14 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
  - 3. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
  - 4. Join dissimilar pipe materials with nonpressure-type flexible couplings.

### 3.4 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  - 1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
  - 2. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
  - 3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
  - 4. Use Extra-Heavy-Duty, top-loading classification cleanouts in roads.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

### 3.5 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

### 3.6 CATCH BASIN INSTALLATION

- A. Set frames and grates to elevations indicated.

### 3.7 STORMWATER INLET INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.

- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
- E. Construct energy dissipaters at outlets, as indicated.

### 3.8 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

### 3.9 CHANNEL DRAINAGE SYSTEM INSTALLATION

- A. Install with top surfaces of components, except piping, flush with finished surface.
- B. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- C. Embed channel sections and drainage specialties in 4-inch minimum concrete around bottom and sides.
- D. Fasten grates to channel sections if indicated.
- E. Assemble channel sections with flanged or interlocking joints.
- F. Embed channel sections in 4-inch minimum concrete around bottom and sides.

### 3.10 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Section 221413 "Facility Storm Drainage Piping."
- B. Make connections to existing piping and underground manholes.
  - 1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for

minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

- a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
  - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- C. Connect to sediment interceptors specified in Section 221323 "Sanitary Waste Interceptors."

### 3.11 IDENTIFICATION

- A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
1. Use warning tape or detectable warning tape over ferrous piping.
  2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.12 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate reports for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to requirements of authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate report for each test.
  5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
    - b. Option: Test plastic piping according to ASTM F 1417.
    - c. Option: Test concrete piping according to ASTM C 924.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 334100



## SECTION 334600 - SUBDRAINAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Perforated-wall pipe and fittings.
2. Geotextile filter fabrics.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For geotextile filter fabrics.

### PART 2 - PRODUCTS

#### 2.1 PERFORATED-WALL PIPES AND FITTINGS

- A. Perforated PE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

#### 2.2 SOIL MATERIALS

- A. Soil materials are specified in Section 312000 "Earth Moving."

#### 2.3 WATERPROOFING FELTS

- A. Material: Comply with ASTM D 226, Type I, asphalt-saturated organic felt.

#### 2.4 GEOTEXTILE FILTER FABRICS

- A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.
- B. Structure Type: Nonwoven, needle-punched continuous filament.
1. Survivability: AASHTO M 288 Class 2.
  2. Styles: Flat and sock.

### PART 3 - EXECUTION

#### 3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

#### 3.2 FOUNDATION DRAINAGE INSTALLATION

- A. Place impervious fill material on subgrade adjacent to bottom of footing after concrete footing forms have been removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches deep and 12 inches wide.
- B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.
- D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.
- E. Install drainage piping as indicated in Part 3 "Piping Installation" Article for foundation subdrainage.
- F. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests.
- G. After satisfactory testing, cover drainage piping to width of at least 6 inches on side away from footing and above top of pipe to within 12 inches of finish grade.
- H. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.
- I. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches.
- J. Place backfill material over compacted drainage course. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

#### 3.3 UNDERSLAB DRAINAGE INSTALLATION

- A. Excavate for underslab drainage system after subgrade material has been compacted but before drainage course has been placed. Include horizontal distance of at least 6 inches between drainage pipe and trench walls. Grade bottom of trench excavations to required slope, and compact to firm, solid bed for drainage system.
- B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.

- D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive or tape.
- E. Install drainage piping as indicated in Part 3 "Piping Installation" Article for underslab subdrainage.
- F. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests.
- G. After satisfactory testing, cover drainage piping with drainage course to elevation of bottom of slab, and compact and wrap top of drainage course with flat-style geotextile filter fabric.

### 3.4 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
  - 1. Foundation Subdrainage: Install piping level and with a minimum cover of 36 inches unless otherwise indicated.
  - 2. Underslab Subdrainage: Install piping level.
  - 3. Retaining-Wall Subdrainage: When water discharges at end of wall into stormwater piping system, install piping level and with a minimum cover of 36 inches unless otherwise indicated.
  - 4. Lay perforated pipe with perforations down.
  - 5. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install thermoplastic piping according to ASTM D 2321.

### 3.5 PIPE JOINT CONSTRUCTION

- A. Join perforated PE pipe and fittings with couplings according to ASTM D 3212 with loose banded, coupled, or push-on joints.
- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

### 3.6 BACKWATER VALVE INSTALLATION

- A. Comply with requirements for backwater valves specified in Section 334100 "Storm Utility Drainage Piping."

- B. Install horizontal backwater valves in header piping downstream from perforated subdrainage piping.
- C. Install horizontal backwater valves in piping in manholes or pits where indicated.

### 3.7 CLEANOUT INSTALLATION

- A. Comply with requirements for cleanouts specified in Section 334100 "Storm Utility Drainage Piping."
- B. Cleanouts for Foundation and Retaining-Wall Subdrainage:
  - 1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
  - 2. In vehicular-traffic areas, use NPS 4 cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches deep. Set top of cleanout flush with grade.
  - 3. In nonvehicular-traffic areas, use NPS 4 PVC pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, deep. Set top of cleanout 1 inch above grade.
  - 4. Comply with requirements for concrete specified in Section 033000 "Cast-in-Place Concrete."
- C. Cleanouts for Underslab Subdrainage:
  - 1. Install cleanouts and riser extensions from piping to top of slab. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
  - 2. Use NPS 4 cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout flush with top of slab.

### 3.8 CONNECTIONS

- A. Comply with requirements for piping specified in Section 334100 "Storm Utility Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect low elevations of subdrainage system to solid-wall-piping storm drainage system.
- C. Where required, connect low elevations of foundation subdrainage to stormwater sump pumps. Comply with requirements for sump pumps specified in Section 221429 "Sump Pumps."

### 3.9 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  - 1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.

2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.
- B. Drain piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

### 3.10 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600

CITY OF DAYTON, OHIO  
DEPARTMENT OF PUBLIC WORKS

Bid

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FOR REFERENCE

Bidder

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Bidder is

An Individual  
Firm Name

\_\_\_\_\_

Business Address

\_\_\_\_\_

Telephone

\_\_\_\_\_

Partnership  
Firm Name

\_\_\_\_\_

Members of Firm and  
Their Business Address

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone

\_\_\_\_\_

Corporation  
Name

\_\_\_\_\_

State of Incorporation

\_\_\_\_\_

Name and Title of  
Officers with Authority  
to Sign Contract

\_\_\_\_\_

\_\_\_\_\_

Home Office Address

\_\_\_\_\_

Local Address

\_\_\_\_\_

Telephone

\_\_\_\_\_

Fax

\_\_\_\_\_

E-mail

\_\_\_\_\_

Federal I.D.#

\_\_\_\_\_

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Bidder:

\_\_\_\_\_

(Person, Firm, or Corporation)

By:

\_\_\_\_\_

Title:

\_\_\_\_\_

FOR REFERENCE

**BID BOND**

Amount \$ \_\_\_\_\_

We, the undersigned, are held and firmly bound unto the City of Dayton, Ohio in the sum of \_\_\_\_\_ Dollars, for the payment of which well and truly to be made, we hereby, jointly and severally, bind ourselves, our heirs, executors, and administrators, firmly by these presents.

The condition of this obligation is such that, if the Bid attached hereto is accepted and the Contract award to the bidder,

\_\_\_\_\_ named therein, and the said bidder shall within ten (10) days after being notified that said contract has been awarded to the bidder, enter into a Contract in the form acceptable to the Director and give bond in a form to be furnished by the Director, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Signed at Dayton, Ohio, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

FOR REFERENCE

\_\_\_\_\_  
Bidder

\_\_\_\_\_  
Surety

\_\_\_\_\_  
Name of Insurance Agency

\_\_\_\_\_  
Address of Insurance Agency

Telephone \_\_\_\_\_ FAX \_\_\_\_\_

6. **FEDERALLY REQUIRED EEO CERTIFICATION FORM**

The bidder hereby certifies that he \_\_\_\_\_, participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 10925, 11114, or 11246, and that he \_\_\_\_\_, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements. *The Bidder must select the appropriate "has or has not" above.*

FOR REFERENCE

CITY OF DAYTON, OHIO  
Department of Public Works

Responsible Contractor Bidding Requirements  
(Form 1 of 2)

In accordance with Ordinance No. 31487-16 of the City of Dayton, Ohio Revised Code of General Ordinances,

I, \_\_\_\_\_ hereby certify that  
(print name – an Officer of the company)

\_\_\_\_\_ meets the following Contractor requirements  
(company)  
relating to this City of Dayton construction project.

Check All That Apply:

- Comply with all City of Dayton income tax obligations and requirements
- Maintain worker's compensation insurance for all employees as required by the State of Ohio
- Comply with State or Federal prevailing wage rate laws, as applicable and required by the funding of this project
- Comply with the State of Ohio Bureau of Worker's Compensation Drug Free Workplace Policy
- Comply with Procurement Standards 2 CFR Parts 200.317 – 200.326 and Appendix II, in addition to any other associated appendices.
- Comply with all City of Dayton procurement requirements

By: \_\_\_\_\_  
(signature)

Title: \_\_\_\_\_

Date: \_\_\_\_\_

CITY OF DAYTON, OHIO  
Department of Public Works

Responsible Contractor Bidding Requirements  
(Form 2 of 2)

- A. Please provide a complete listing of the fringe benefits provided to employees expected to be utilized at the project site, including, but not limited, to health insurance and retirement benefits. {Reference to benefits traditionally provided on past, similar projects can be made.}

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- B. Please identify any “bona fide apprentice training program” in which this company participates in accordance with the Ohio Bureau of Apprenticeship Training and the U. S. Department of Labor.

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- C. Please provide a list of subcontractors whose quotes or information are included or used in the bid submitted for this project.

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FOR REFERENCE

**CERTIFICATION**  
**OF COMPLIANCE WITH OHIO REVISED CODE SECTION 3517.13**  
**FOR CONTRACTS IN EXCESS OF FIVE HUNDRED DOLLARS (\$500.00)**

STATE OF OHIO,  
COUNTY OF \_\_\_\_\_,ss:

\_\_\_\_\_ being duly sworn, deposes and states as follows:

1. I am duly authorized to make the statements contained herein on behalf of \_\_\_\_\_ (“the Contracting Party”).
2. The Contracting Party is a/an (select one):
  - Individual, partnership, or other unincorporated business association (including without limitation, a professional association organized under Ohio Revised Code Chapter 1785), estate, or trust.
  - Corporation organized and existing under the laws of the State of \_\_\_\_\_.
  - Labor organization.
3. I hereby affirm that the Contracting Party and each of the individuals specified in R.C. 3517.93(I)(with respect to non-corporate entities and labor organizations) or R.C. 3517.93(J)(with respect to corporations) are in full compliance with the political contributions limitations set forth in R.C. 3517.93(I) and (J), as applicable. I understand that a false representation on this certification constitutes a felony of the fifth degree pursuant to 3517.992(R). Any contract that contains a falsified certification shall be rescinded.

By: \_\_\_\_\_

Title: \_\_\_\_\_



**AFFIRMATIVE ACTION PROGRAM  
EQUAL EMPLOYMENT OPPORTUNITY**

**PROJECT:** \_\_\_\_\_  
NAME LOCATION

During the performance of this contract:

\_\_\_\_\_  
CONTRACTOR ADDRESS TELEPHONE / FAX

being the general contractor, assumes the responsibility and obligation to institute an Affirmative Action Program which complies with revised City Ordinances 24059 and 26090 and Executive Order 11246 on any city, federal or federally-assisted construction project, to insure Equal Employment Opportunity regardless of race, color, religion, sex, national origin, ancestry, place of birth, age, or marital status.

The successful contractor using one or more trades of construction employees must comply with Part I of these Affirmative Actions Program conditions to each such trade.

**Part I: Requirements.** To be eligible for award of a contract under this Invitation to Bid, contractors must certify as prescribed in Paragraph 1a, of the certification specified in Part II hereof that it adopts the minimum goals and timetables of minority and female worker utilization, and specific Affirmative Action steps set forth in Sections 1 and 2 of this Part I.

- 1.) **Goals & Timetables.** The goals of minority and female worker utilization required of the contractor are applicable to each trade which will be used on any project in Greene, Miami, Montgomery, and Preble Counties, OH (hereinafter the Economic Area).

The required goals and timetables are as follows:

	Goals of Minority Worker Utilization Expressed in Percentage Terms
From 1/1/2000 to Present	11.5%
	Goals of Female Worker Utilization Expressed in Percentage Terms
From 4/1/80 to Present	6.9%

The percentage goals of minority and female worker utilization are expressed in terms of working hours of training and employment as a proportion of the total working hours to be worked by the contractor's entire work force in that trade on all projects (both federal and non-federal) in the Economic Area during the performance of this contract. The working hours for minority and female work and training must be uniform throughout the length of this contract, on all projects and for each of the trades. Further, the transfer of minority and/or female or trainee from employer-to-employer or from project-to-project for the sole purpose of meeting the contractor's goals shall be a violation of this Affirmative Action Program.

In reaching the goals for minority and female utilization, every effort shall be made to find and employ qualified journey-persons. Provided, however, and pursuant to the requirements of the Department of Labor Regulations, 29 CFR 5a.3, twenty-five percent (25%) of apprentices or trainees shall be employed on all projects and shall be in their first year of training, where feasible.

In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the contractor during the training period, and the contractor must have made a commitment to employ the apprentices and/or trainees at the completion of the training subject to the availability of employment opportunities. Apprentices and trainees must be trained pursuant to programs which have been approved by The U.S. Department of Labor and/or The State of Ohio.

A contractor shall be deemed to be in compliance with the terms and requirements of this Part I by the employment and training of minorities and females in the appropriate percentage of the contractor's aggregate work force in the Economic Area for each trade for which it is committed to the goals under Part I.

However, no contractor shall be found to be in noncompliance solely on account of the contractor's failure to meet the goals and timetables, but such contractor shall be given the opportunity to demonstrate that all of the specific Affirmative Action steps specified in Part I have been instituted and has made every "good faith" effort to make these steps work towards the attainment of the goals and timetables.

2.) **Specific Affirmative Action Steps.** A contractor subject to Part I, must engage in Affirmative Action directed at increasing minority and female utilization, which is at least as extensive and as specific as the following steps:

a) The contractor shall notify community organizations that the contractor has employment opportunities available and shall maintain records of the organizations' responses.

b) The contractor shall maintain a file of the names and addresses of each minority and female referred and what action was taken with respect to each referred worker. If the worker was not employed, the reason therefor. If the worker was not sent to the union hiring hall for referral, the contractor's file shall document this and the reasons therefore.

c) The contractor shall promptly notify the Dayton Human Relations Council (HRC) when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority and/or female, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

d) The contractor should participate in training programs in the area; especially those approved by the U.S. Department of Labor and/or the State of Ohio.

e) The contractor shall disseminate the EEO Policy within the organization by including it in any policy manual, by publicizing it in company newspapers, annual reports, etc.; by conducting staff, employee and union representatives' meetings to explain and discuss the policy; by posting of the policy; and by specific review of the policy with minority and female employees.

f) The contractor shall ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to all projects (both federal and non-federal) in the Economic Area during the performance of its contract or subcontract.

g) The contractor shall make specific and constant personal (both written and oral) recruitment efforts directed at all minority and female organizations, schools, minority and female recruitment training organizations with the Dayton Economic Area.

h) The contractor shall make specific efforts to encourage present minority and female employees to recruit other minorities and females.

i) The contractor shall validate all tests and other selection requirements.

j) The contractor should develop on-the-job training opportunities; participate and assist in any association or employer-group training programs relevant to the contractor's employees needs consistent with its obligations under Part I.

k) The contractor shall evaluate all minority and female personnel for promotional opportunities and encourage employees to seek such opportunities.

l) The contractor shall ensure that seniority practices, job classifications, etc., do not have a discriminatory effect.

m) The contractor shall make certain that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

n) The contractor will monitor all personnel activities to ensure that its EEO Policy is being carried out.

o) The successful contractor shall solicit bids for work to be performed on this project under a subcontract from minority and female contractors and other business associations.

3.) Nothing herein is intended to relieve any contractor during the term of this project from compliance with any other local bid requirements. Further, it shall be the responsibility of each contractor to comply with all terms, conditions, and provisions of the Affirmative Action Programs.

**Part II: Contractor's Certification.** A contractor will not be eligible for award of a contract under this Invitation to Bid, unless such contractor has submitted as a part of the bid the following certification, which will be deemed a part of the resulting contract:

**CONTRACTOR'S CERTIFICATION**

\_\_\_\_\_ (Contractor) certifies that:

1. The following listed construction trades will be used in performance of this project.


a) as to those trades set forth in the preceding paragraph one hereof, it adopts the minimum minority and female utilization goals and the specific Affirmative Action steps contained in this Affirmative Action Program. Compliance is measured in each trade of the contractor's aggregate work force for all construction work (both federal and non-federal) in the four Counties (Greene, Miami, Montgomery and Preble) subject to this Affirmative Action Program; and

b) the successful contractor will obtain from each subcontractor and submit to the contracting or administering agency prior to the award of any subcontract under this contract, the subcontractor certification required by the Affirmative Action Program.

**SIGN:**

\_\_\_\_\_

(Signature of Authorized Representative of Bidder)

**FAILURE TO SIGN AND SUBMIT THIS DOCUMENT WITH YOUR BID  
WILL RESULT IN YOUR BID NOT BEING READ**



# MBE-CERTIFIED PARTICIPATION FORM

**Instructions for Bidders / Proposers:** Submit one executed copy of this form for each Minority Business Certified Firm whose participation you plan to count toward the project/contract's participation goal(s). This form must be included with your Bid

## SECTION 1: BIDDER / PROPOSER INFORMATION

Name of Bidder / Proposer's Firm: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Telephone: \_\_\_\_\_ Email: \_\_\_\_\_

Primes Base Bid \$ \_\_\_\_\_

Name of Project: \_\_\_\_\_

## SECTION 2: MBE-CERTIFIED BUSINESS & PARTICIPATION INFORMATION

Name of MBE-Certified Firm: \_\_\_\_\_

MBE-Certified Firm's Tax ID#: \_\_\_\_\_

Scope of Work to Be Performed by Certified Firm: \_\_\_\_\_

\_\_\_\_\_

	Total Dollar Amount Towards Goal	Percentage Towards Goal	Amount to Be Paid to This MBE Firm for the Work Described:
Total Bid	\$ _____	% _____	\$ _____
Materials	\$ _____	% _____	\$ _____
Labor	\$ _____	% _____	\$ _____

## SECTION 3: AFFIRMATIONS

The above-named **Bidder / Proposer** affirms, under penalty of perjury, that it has negotiated in good faith with the above-named MBE-Certified Firm and will utilize the above-named MBE-Certified Firm for the type(s) of work and for the dollar amount(s) described above.

\_\_\_\_\_  
(Signature of Bidder/Proposer's Authorized Agent)

\_\_\_\_\_  
(Printed Name of Bidder/Proposer's Authorized Agent)

\_\_\_\_\_ (Title of Bidder/Proposer's Authorized Agent) \_\_\_\_\_ (Date)

**IF THE BIDDER/OFFEROR IS NOT AWARDED A CONTRACT, OR IF THE HRC DOES NOT APPROVE OF THE TERMS AS STATED ABOVE, THEN ANY AND ALL REPRESENTATIONS ON THIS PARTICIPATION FORM SHALL BE NULL AND VOID.**



# PARTICIPATION COMMITMENT AND/OR WAIVER REQUEST FORM

*Instructions for Bidders/Proposers: Submit one (1) executed copy of this form with your Bid/Proposal.*

- *If Option 1 is selected, you must also submit one (1) executed MBE-Certified Participation Form for each MBE-Certified Firm whose participation you plan to count toward the project/contract's participation goal(s).*
- *If Option 2 (WAIVER REQUEST) is selected, you must also submit documentation of your Good Faith Efforts to the City of Dayton Human Relations Council (HRC) within two (2) business days of the Bid Opening / Proposal Due Date. Bidders/Proposers will receive no further reminders about this deadline.*

**The undersigned affirms that the Bidder/Proposer has satisfied the requirements of the Bid/RFP Specification in the following manner:** (Check the box for Option 1 and/or Option 2, complete the appropriate spaces, and sign below.)

- Option 1.** The Bidder/Proposer has secured enough commitment(s) from one or more Certified Firms to meet or exceed the project's MBE participation goal(s). The Bidder/Proposer is committed to a minimum of:

% MBE
-------

participation on this contract, as detailed on the executed MBE-Certified Participation Form(s) submitted with this Bid/Proposal.

- Option 2 (WAIVER REQUEST).** The Bidder/Proposer is unable to meet the project's MBE participation goal and requests that the goal be waived:

The Bidder/Proposer's documentation of Good Faith Efforts to meet the participation goal checked above must be submitted to the HRC within two (2) business days of the Bid Opening / Proposal Due Date. *The Bidder/Proposer will receive no further reminders about this deadline.*

A waiver will be granted based on a Bidder/Proposer's documented Good Faith Efforts, and only when the HRC determines that the Bidder/Proposer has completed all of the following activities:

1. *Solicited the interest of all MBE-Certified Firms having the capability to perform the work of the contract.* The Bidder/Proposer must solicit this interest at least ten (10) business days before the Bid Opening / Proposal Due Date in order to allow the MBE-Certified Firm sufficient time to respond to the solicitation. Electronic communication will not be deemed as sufficient Good Faith Efforts, if it is the sole method of communication used.
2. *Divided contract work items into economically feasible units to facilitate participation,* even when the Bidder/Proposer might otherwise prefer to perform these work items with its own forces.
3. *Negotiated in good faith with MBE-Certified Firms,* and considered the firms' prices and capabilities as well as the contract goals. Rejected Certified Firms as being unqualified only for reasons based on a diligent investigation of their capabilities. The Bidder/Proposer's standing within its industry; membership in specific groups, organizations, or associations; and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes to reject or not solicit bids from particular Certified Firms.
4. *Provided interested MBE-Certified Firms with plans and specifications at no cost,* or directed them to the Greater Dayton Minority Business Assistance Center (Dayton MBAC) for information about the project's plans, specifications, and requirements at least ten (10) business days prior to the Bid Opening / Proposal Due Date in order to assist them in responding to a solicitation.
5. *Sought the Dayton MBAC's assistance* or used the services of community organizations; contractors' groups; local, state or federal business assistance offices; or similar organizations to find MBE-Certified Firms. Contacting the HRC for a list of certified companies will not be deemed as sufficient Good Faith Efforts.

NOTE: In determining whether a Bidder/Proposer has made Good Faith Efforts, the HRC may take into account the performance of other Bidders/Proposers in meeting the goal. For example, when the apparent low bidder fails to meet a participation goal but others meet it, the HRC may reasonably raise the question of whether, with additional reasonable efforts, the apparent low bidder could have met the goal.

\_\_\_\_\_  
(Signature of Bidder/Offoror's Authorized Agent)

\_\_\_\_\_  
(Name of Bidder/Proposer's Firm)

\_\_\_\_\_  
(Printed Name of Bidder/Offoror's Authorized Agent)

\_\_\_\_\_  
(Title of Bidder/Offoror's Authorized Agent)

\_\_\_\_\_  
(Date)

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Asbestos Local 207

**Type of Rate:** Commercial

**Change #:**  
LCN01-2025ib

**Craft:**  
Asbestos Worker

**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												
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, Sheffield, 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 #:**  
LCN02-2025ib

**Craft:**  
Asbestos Worker

**Effective Date:**  
7/30/2025

**Effective Date:**  
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 #:**  
LCN02-2013fb

**Craft:**  
Boilermaker

**Effective Date:**  
10/1/2013

**Effective Date:**  
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 (Dayton Tile Finisher)

**Type of Rate:** Commercial

**Change #:**  
LCN01-2024ib

**Craft:**  
Bricklayer

**Effective Date:**  
7/1/2024

**Effective Date:**  
7/1/2024

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Bricklayer Tile Marble Terrazzo Finisher	\$27.78		\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.83	\$52.72
Base Machine	\$28.28		\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.33	\$53.47
Apprentice	BHR	Percent										
1st 6 months 0-600 hrs	\$16.67	\$60.00	\$3.70	\$0.00	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$20.86	\$29.19
2nd 6 months 601-1200 hrs	\$18.06	\$65.00	\$3.70	\$0.00	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$22.25	\$31.28
3rd 6 months 1201-1800 hrs	\$19.45	\$70.00	\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$30.50	\$40.22
4th 6 months 1801-2400	\$20.84	\$75.02	\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.89	\$42.31
5th 6 months 2401-3000 hrs	\$22.22	\$80.00	\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$33.27	\$44.39
6th 6 months 3001-3600 hrs	\$25.00	\$90.00	\$3.70	\$6.86	\$0.49	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.05	\$48.55
TMT Helper - May enter Apprentice Program after 90 day completion	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
First 90 Days	\$12.50	\$45.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$12.50	\$18.75

**(\*)Special Calculation Note :**

Classification title contains "Bricklayer" because contract originates within the Bricklayer Local. Note that the classification description is clarified after the local union number at the top of the page. \*\*\*Medical Savings Account\*\*\*: The Medical Savings Account can only be deducted providing employee shows proof voluntary enrollment in the program. Minimum contribution of \$1.00 per hourworked with no maximum.

**Ratio :**

1 Journeyman 1 Apprentice 5 Journeyman 1 Apprentice 10 Journeyman 2 Apprentice 15 Journeyman 3 Apprentice 20  
Journeyman 4 Apprentice 25 Journeyman 5 Apprentice 8 Employees 1 Helper

**Jurisdiction ( \* denotes special jurisdictional note ) :**

Auglaize, Champaign, Clark, Clinton, Darke, Greene, Hardin, Highland, Logan, Mercer, Miami, Montgomery, Preble\*,  
Shelby

**Special Jurisdictional Note :**

In Preble County the following townships are included: (Jackson, Monroe, Harrison, Twin and Washington)

**Details :**

Tile Layer Finishers shall do mixing of mortars & adhesives, cleaning & grouting of tile, unloading of all trucks, unpacking & handling of all tile & materials such as sand, lime, cement, tile, & all types of tile panels, prefabricated on job site.  
Marble Setter Finishers shall do all cleaning, waxing & polishing, grouting and pointing.

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Bricklayer Local 23 (Dayton Tile Mechanic)

**Type of Rate:** Commercial

**Change #:**  
LCN01-2025ib

**Craft:**  
Bricklayer

**Effective Date:**  
7/1/2025

**Effective Date:**  
7/1/2025

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Bricklayer Tile Marble Terrazzo Mechanics	\$33.34		\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$50.35	\$67.02
Terrazzo Worker	\$33.34		\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$50.35	\$67.02
Apprentice	BHR	Percent										
1st 6 Months	\$20.00	\$60.00	\$9.42	\$0.00	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$30.02	\$40.03
2nd 6 Months	\$21.67	\$65.00	\$9.42	\$0.00	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$31.69	\$42.53
3rd 6 Months	\$23.34	\$70.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.35	\$52.02
4th 6 Months	\$25.01	\$75.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$42.02	\$54.52
5th 6 months	\$26.67	\$80.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.68	\$57.02
6th 6 months	\$28.34	\$85.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$45.35	\$59.52
7th 6 months	\$30.01	\$90.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$47.02	\$62.02
8th 6 months	\$31.67	\$95.00	\$9.42	\$6.99	\$0.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$48.68	\$64.52

**(\*)Special Calculation Note :**

**Ratio :**

5 Journeymen to 1 Apprentice 10 Journeymen to 2 Apprentice 15 Journeymen to 3 Apprentice 20 Journeymen to 4 Apprentice 25 Journeymen to 5 Apprentice

**Jurisdiction ( \* denotes special jurisdictional note ) :**

Champaign, Clark, Clinton, Darke, Greene, Highland, Logan, Miami, Montgomery, Preble\*, Shelby

**Special Jurisdictional Note :**

In Preble County the following townships are included: (Jackson, Jefferson, Monroe, Harrison, Twin and Washington)

**Details :**

\*\* (Tile layers work) the laying, cutting or setting of all tile where used for floors, walls, ceilings, walks, promenade roofs, stair treads, stair risers, facings, hearths, fireplaces & decorative inserts together with any marble plinths, thresholds or window stools used in connection with any tile work. the building, shaping forming construction or repairing of all fireplace work, whether in connection with a mantel hearth facing or not, & the setting & preparing of all material such as cement, plaster, mortar, brickwork, iron work or other materials necessary for the proper, safe construction & completion of such work: except that a mantel made exclusively of brick, marble or stone shall be conceded to be bricklayers, marble setters or stonemasons' work respectively. \*\* Marble, mosaic, venetian enamel & terrazzo. Cutting and assembling of mosaics. all rolling of terrazzo work. \*\* Caulking of all expansion, perimeter & angle joints shall be the exclusive work of the tile mechanic. \*\* Marble masons shall consist of carving, cutting & setting of all marble, slate (including blackboards) stone, albereen, carrara, sanionyx, vitrolite & similar opaque glass, scagliola, what ever thickness or dimension.

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Bricklayer Local 23 (Dayton)

**Type of Rate:** Commercial

**Change #:**  
LCN01-2025ib

**Craft:**  
Bricklayer

**Effective Date:**  
6/1/2025

**Effective Date:**  
6/1/2025

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Bricklayer Stone Mason Refractory	\$34.58		\$10.40	\$7.79	\$0.64	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$53.91	\$71.20
Pointer/Caulker/Cleaner	\$34.58		\$10.40	\$7.79	\$0.64	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$53.91	\$71.20
Improver Apprentices 25 day probationary period then	\$		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1st 6 months	\$22.48		\$10.40	\$0.00	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$33.92	\$45.16
2nd 6 months	\$25.94		\$10.40	\$0.00	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$37.38	\$50.35
3rd 6 months	\$29.39		\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$47.32	\$62.02
4th 6 months	\$32.85		\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$50.78	\$67.21
Apprentice	BHR	Percent										
1st 6 months	\$20.75	\$60.00	\$10.40	\$0.00	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$32.19	\$42.56
2nd 6 months	\$22.48	\$65.00	\$10.40	\$0.00	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$33.92	\$45.16
3rd 6 months	\$24.21	\$70.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$42.14	\$54.24
4th 6 months	\$25.94	\$75.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$43.87	\$56.83
5th 6 months	\$27.66	\$80.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$45.59	\$59.43
6th 6 months	\$29.39	\$85.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$47.32	\$62.02
7th 6 months	\$31.12	\$90.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$49.05	\$64.61
8th 6 months	\$32.85	\$95.00	\$10.40	\$6.49	\$0.54	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$50.78	\$67.21
Mason Trainee 1-90 Days	\$15.56	\$45.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$16.06	\$23.84
91-365 Days	\$15.56	\$45.00	\$10.40	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$26.46	\$34.24
2nd Year	\$17.29	\$50.00	\$10.40	\$0.00	\$0.00	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$28.19	\$36.84

**(\*)Special Calculation Note :**

Apprentice and Apprentice Improver, Health and Welfare after 30 days. Mason Trainees Health and Welfare after 90 days.

**Ratio :**

Bricklayer Stone Mason Refractory Worker: 1-2 Journeymen to 1 Apprentice 3-4 Journeymen to 2 Apprentice 5-6 Journeymen to 2 Apprentice 7-10 Journeymen to 3 Apprentice Mason Trainee Ratio: 1 Apprentice permits 1 Mason Trainee 2 Apprentice permits 1 Mason Trainee 3 Apprentice permits 2 Mason Trainee 4 Apprentice permits 2 Mason Trainee \*\*\*In order to utilize a Pre-Apprentice, you must have 1 registered apprentice in your employ\*\*\*. Ratio of Improver Apprentices to Journeymen in no case shall their be no more than 1 Improver Apprentice to 6 Journeymen

**Jurisdiction ( \* denotes special jurisdictional note ) :**

Champaign, Clark, Clinton, Darke, Greene, Highland, Logan, Miami, Montgomery, Preble\*, Shelby

**Special Jurisdictional Note :**

In Preble County the following townships are included: Jackson, Monroe, Harrison, Twin, Jefferson and Washington

**Details :**

Apprentice Ratio's covers: Bricklayer, Stone Mason, Refractory worker and Pointer, Cleaner, Caulker.

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Bricklayer Local 23 Heavy Hwy (A)

**Type of Rate:** Commercial

**Change #:**  
LCN01-2026ib

**Craft:**  
Bricklayer

**Effective Date:**  
3/25/2026

**Effective Date:**  
3/25/2026

	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	\$34.56		\$10.20	\$9.68	\$0.56	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$56.30	\$73.58
Apprentice	BHR	Percent										
1st year	\$24.19	\$70.00	\$10.20	\$9.68	\$0.56	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$45.93	\$58.03
2nd year	\$27.65	\$80.00	\$10.20	\$9.68	\$0.56	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$49.39	\$63.21
3rd year	\$31.10	\$90.00	\$10.20	\$9.68	\$0.56	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$52.84	\$68.39

**(\*)Special Calculation Note :**

This rate is not for building construction.

This rate applies only to the Cement Masons. All other Bricklaying, PCC, Stone, Tile, Marble, Refractory, Industrial and all other applicable work performed will be performed under the applicable rates for those contracts.

**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 :**

Bricklayer Local 23 Heavy Hwy (A): Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work.

Bricklayer Local 23 Heavy Hwy (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 #:**  
LCN01-2026ib

**Craft:**  
Bricklayer

**Effective Date:**  
3/25/2026

**Effective Date:**  
3/25/2026

	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	\$35.56		\$10.20	\$9.68	\$0.57	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$57.31	\$75.09
Apprentice	BHR	Percent										
1st year	\$24.89	\$70.00	\$10.20	\$9.68	\$0.57	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$46.64	\$59.09
2nd year	\$28.45	\$80.00	\$10.20	\$9.68	\$0.57	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$50.20	\$64.42
3rd year	\$32.00	\$90.00	\$10.20	\$9.68	\$0.57	\$0.00	\$1.30	\$0.00	\$0.00	\$0.00	\$53.75	\$69.75

**(\*)Special Calculation Note :**

This rate is not for building construction.

This rate applies only to the Cement Masons. All other Bricklaying, PCC, Stone, Tile, Marble, Refractory, Industrial and all other applicable work performed will be performed under the applicable rates for those contracts.

**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 :**

Bricklayer Local 23 Heavy Hwy (A): Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site Heavy Construction, Airport Construction Or Railroad Construction Work.

Bricklayer Local 23 Heavy Hwy (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 #:**  
LCN01-2026ib

**Craft:**  
Carpenter

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Journeyman	\$37.49		\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$62.57	\$81.31
Apprentice	BHR	Percent										
1st 6 Months	\$26.24	\$70.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$51.32	\$64.44
2nd 6 Months	\$26.24	\$70.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$51.32	\$64.44
3rd 6 Months	\$29.99	\$80.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$55.07	\$70.06
4th 6 Months	\$29.99	\$80.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$55.07	\$70.06
5th 6 Months	\$33.74	\$90.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$58.82	\$75.69
6th 6 Months	\$33.74	\$90.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$58.82	\$75.69
7th 6 Months	\$35.62	\$95.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$60.70	\$78.51
8th 6 Months	\$35.62	\$95.00	\$10.31	\$6.95	\$0.80	\$0.00	\$6.87	\$0.15	\$0.00	\$0.00	\$60.70	\$78.51

**(\*)Special Calculation Note :**

Other: UBC National Fund

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.

**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 Apprentices employed. Thereafter, every third additional 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, gas lines).

Industrial & Building Site, Power Plant, Amusement Park, Athletic Stadium Site, Sewer and Water Plants.

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Carpenter & Pile Driver SW Zone 1

**Type of Rate:** Commercial

**Change #:**  
LCN01-2025ib

**Craft:**  
Carpenter

**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												
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 Locals 2 & 136 Floorlayer SW

**Type of Rate:** Commercial

**Change #:**  
LCN02-2025sks

**Craft:**  
Carpenter

**Effective Date:**  
9/17/2025

**Effective Date:**  
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 #:**  
LCN01-2025ib

**Craft:**  
Cement Mason

**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												
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 #:**  
LCN01-2026ib

**Craft:**  
Cement Mason

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason	\$39.18		\$9.30	\$7.65	\$0.75	\$0.00	\$2.45	\$0.08	\$0.00	\$0.00	\$59.41	\$79.00
Apprentice	BHR	Percent										
1st Year	\$27.43	\$70.00	\$9.30	\$7.65	\$0.75	\$0.00	\$2.45	\$0.08	\$0.00	\$0.00	\$47.66	\$61.38
2nd Year	\$31.34	\$80.00	\$9.30	\$7.65	\$0.75	\$0.00	\$2.45	\$0.08	\$0.00	\$0.00	\$51.57	\$67.24
3rd Year	\$35.26	\$90.00	\$9.30	\$7.65	\$0.75	\$0.00	\$2.45	\$0.08	\$0.00	\$0.00	\$55.49	\$73.12

**(\*)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 #:**  
LCN01-2026ib

**Craft:**  
Electrical

**Effective Date:**  
1/7/2026

**Effective Date:**  
1/7/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Electrical Lineman	\$54.94		\$7.50	\$1.65	\$0.55	\$0.00	\$13.19	\$1.00	\$0.00	\$0.00	\$78.83	\$106.30
Certified Lineman Welder	\$54.94		\$7.50	\$1.65	\$0.55	\$0.00	\$13.19	\$1.00	\$0.00	\$0.00	\$78.83	\$106.30
Certified Cable Splicer	\$54.94		\$7.50	\$1.65	\$0.55	\$0.00	\$13.19	\$1.00	\$0.00	\$0.00	\$78.83	\$106.30
Operator A	\$49.20		\$7.50	\$1.48	\$0.49	\$0.00	\$11.81	\$1.00	\$0.00	\$0.00	\$71.48	\$96.08
Operator B	\$43.52		\$7.50	\$1.31	\$0.44	\$0.00	\$10.44	\$1.00	\$0.00	\$0.00	\$64.21	\$85.97
Operator C	\$34.93		\$7.50	\$1.05	\$0.35	\$0.00	\$8.38	\$1.00	\$0.00	\$0.00	\$53.21	\$70.67
Groundman 0-12 months Exp	\$27.47		\$7.50	\$0.82	\$0.27	\$0.00	\$6.59	\$1.00	\$0.00	\$0.00	\$43.65	\$57.38
Groundman 0-12 months Exp w/CDL	\$30.22		\$7.50	\$0.91	\$0.30	\$0.00	\$7.25	\$1.00	\$0.00	\$0.00	\$47.18	\$62.29
Groundman 1 yr or more	\$30.22		\$7.50	\$0.91	\$0.30	\$0.00	\$7.25	\$1.00	\$0.00	\$0.00	\$47.18	\$62.29
Groundman 1 yr or more w/CDL	\$35.71		\$7.50	\$1.07	\$0.36	\$0.00	\$8.57	\$1.00	\$0.00	\$0.00	\$54.21	\$72.06
Equipment Mechanic A	\$43.52		\$7.50	\$1.31	\$0.44	\$0.00	\$10.44	\$1.00	\$0.00	\$0.00	\$64.21	\$85.97
Equipment Mechanic B	\$39.22		\$7.50	\$1.18	\$0.39	\$0.00	\$9.41	\$1.00	\$0.00	\$0.00	\$58.70	\$78.31
Equipment Mechanic C	\$34.92		\$7.50	\$1.05	\$0.35	\$0.00	\$8.38	\$1.00	\$0.00	\$0.00	\$53.20	\$70.66
X-Ray Technician	\$54.94		\$7.50	\$1.65	\$0.55	\$0.00	\$13.19	\$1.00	\$0.00	\$0.00	\$78.83	\$106.30
Apprentice	BHR	Percent										
1st 1000 hrs	\$32.96	\$60.00	\$7.50	\$0.99	\$0.33	\$0.00	\$7.91	\$1.00	\$0.00	\$0.00	\$50.69	\$67.17
2nd 1000 hrs	\$35.71	\$65.00	\$7.50	\$1.07	\$0.36	\$0.00	\$8.57	\$1.00	\$0.00	\$0.00	\$54.21	\$72.06
3rd 1000 hrs	\$38.46	\$70.00	\$7.50	\$1.15	\$0.38	\$0.00	\$9.23	\$1.00	\$0.00	\$0.00	\$57.72	\$76.95

4th 1000 hrs	\$41.20	\$75.00	\$7.50	\$1.24	\$0.41	\$0.00	\$9.89	\$1.00	\$0.00	\$0.00	\$61.24	\$81.84
5th 1000 hrs	\$43.95	\$80.00	\$7.50	\$1.32	\$0.44	\$0.00	\$10.55	\$1.00	\$0.00	\$0.00	\$64.76	\$86.74
6th 1000 hrs	\$46.70	\$85.00	\$7.50	\$1.39	\$0.47	\$0.00	\$11.21	\$1.00	\$0.00	\$0.00	\$68.27	\$91.62
7th 1000 hrs	\$49.45	\$90.00	\$7.50	\$1.48	\$0.49	\$0.00	\$11.87	\$1.00	\$0.00	\$0.00	\$71.79	\$96.52

**(\*)Special Calculation Note :**

Other is Health Reimbursement 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 :**

Operator "A": John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater than 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.

**Special Notes:**

When Cable Splicer helpers are used, they must be a Journeyman Lineman.

Pipe installation, holiday testing, welding, cable splicing operation of vacuum pumps and cable pulling equipment and all work requiring the use of hand tools shall be done by Journeymen and Apprentices. Pipe coating, manhole preparations and conditioning, nitrogen connections and flowmeter installation shall be done by or under the direct supervision of a Journeyman.

At least two (2) Journeyman Linemen in addition to certified lineman welders shall be employed to install high voltage pipe.

When pulling cable, at least six (6) of the workmen shall be no less than Journeyman classifications. When pumping oil, only Journeyman Lineman or equipment operators shall be permitted to operate degasifying and oil pumping equipment

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Electrical Local 71 Outside Utility Power

**Type of Rate:** Commercial

**Change #:**  
LCN01-2026ib

**Craft:**  
Electrical

**Effective Date:**  
1/7/2026

**Effective Date:**  
1/7/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Electrical Lineman	\$52.03		\$7.50	\$1.56	\$0.52	\$0.00	\$12.49	\$1.00	\$0.00	\$0.00	\$75.10	\$101.12
Substation Technician	\$52.03		\$7.50	\$1.56	\$0.50	\$0.00	\$12.49	\$1.00	\$0.00	\$0.00	\$75.08	\$101.09
Cable Splicer	\$54.50		\$7.50	\$1.64	\$0.55	\$0.00	\$13.08	\$1.00	\$0.00	\$0.00	\$78.27	\$105.52
Operator A	\$46.61		\$7.50	\$1.40	\$0.47	\$0.00	\$11.19	\$1.00	\$0.00	\$0.00	\$68.17	\$91.47
Operator B	\$41.17		\$7.50	\$1.23	\$0.41	\$0.00	\$9.87	\$1.00	\$0.00	\$0.00	\$61.18	\$81.77
Operator C	\$33.00		\$7.50	\$0.99	\$0.33	\$0.00	\$7.92	\$1.00	\$0.00	\$0.00	\$50.74	\$67.24
Groundman 0-12 months Exp	\$26.02		\$7.50	\$0.78	\$0.26	\$0.00	\$6.24	\$1.00	\$0.00	\$0.00	\$41.80	\$54.81
Groundman 0-12 months Exp w/CDL	\$28.62		\$7.50	\$0.86	\$0.29	\$0.00	\$6.87	\$1.00	\$0.00	\$0.00	\$45.14	\$59.45
Groundman 1 yr or more	\$28.62		\$7.50	\$0.86	\$0.29	\$0.00	\$6.87	\$1.00	\$0.00	\$0.00	\$45.14	\$59.45
Groundman 1 yr or more w/CDL	\$33.82		\$7.50	\$1.01	\$0.34	\$0.00	\$8.12	\$1.00	\$0.00	\$0.00	\$51.79	\$68.70
Equipment Mechanic A	\$41.17		\$7.50	\$1.23	\$0.41	\$0.00	\$9.87	\$1.00	\$0.00	\$0.00	\$61.18	\$81.77
Equipment Mechanic B	\$37.09		\$7.50	\$1.11	\$0.37	\$0.00	\$8.90	\$1.00	\$0.00	\$0.00	\$55.97	\$74.52
Equipment Mechanic C	\$33.00		\$7.50	\$0.99	\$0.33	\$0.00	\$7.92	\$1.00	\$0.00	\$0.00	\$50.74	\$67.24
Line Truck w/auger	\$36.40		\$7.50	\$1.09	\$0.36	\$0.00	\$8.71	\$1.00	\$0.00	\$0.00	\$55.06	\$73.26
Apprentice	BHR	Percent										
1st 1000 hrs	\$31.22	\$60.00	\$7.50	\$0.94	\$0.31	\$0.00	\$7.49	\$1.00	\$0.00	\$0.00	\$48.46	\$64.07
2nd 1000 hrs	\$33.82	\$65.00	\$7.50	\$1.01	\$0.34	\$0.00	\$8.12	\$1.00	\$0.00	\$0.00	\$51.79	\$68.70
3rd 1000 hrs	\$36.42	\$70.00	\$7.50	\$1.09	\$0.36	\$0.00	\$8.74	\$1.00	\$0.00	\$0.00	\$55.11	\$73.32

4th 1000 hrs	\$39.02	\$75.00	\$7.50	\$1.17	\$0.39	\$0.00	\$9.37	\$1.00	\$0.00	\$0.00	\$58.45	\$77.96
5th 1000 hrs	\$41.62	\$80.00	\$7.50	\$1.25	\$0.44	\$0.00	\$9.99	\$1.00	\$0.00	\$0.00	\$61.80	\$82.61
6th 1000 hrs	\$44.23	\$85.00	\$7.50	\$1.33	\$0.44	\$0.00	\$10.61	\$1.00	\$0.00	\$0.00	\$65.11	\$87.22
7th 1000 hrs	\$46.83	\$90.00	\$7.50	\$1.40	\$0.47	\$0.00	\$11.24	\$1.00	\$0.00	\$0.00	\$68.44	\$91.86

**(\*)Special Calculation Note :**

Other: Health Reimbursement 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 :**

Operator "A": John Henry Rock Drill, D-6 (or equivalent) and above, Trackhoe Digger, (320 Track excavator), Cranes (greater than 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.

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Electrical Local 71 Underground Residential Distribution

**Type of Rate:** Commercial

**Change #:**  
LCN01-2026ib

**Craft:**  
Electrical

**Effective Date:**  
1/7/2026

**Effective Date:**  
1/7/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
URD Electrician	\$39.42		\$7.50	\$1.18	\$0.39	\$0.00	\$9.43	\$1.00	\$0.00	\$0.00	\$58.92	\$78.63
Equipment Operator A	\$35.24		\$7.50	\$1.06	\$0.35	\$0.00	\$8.46	\$1.00	\$0.00	\$0.00	\$53.61	\$71.23
Equipment Operator B	\$32.34		\$7.50	\$0.97	\$0.32	\$0.00	\$7.76	\$1.00	\$0.00	\$0.00	\$49.89	\$66.06
Directional Drill Locator	\$35.24		\$7.50	\$1.06	\$0.35	\$0.00	\$8.46	\$1.00	\$0.00	\$0.00	\$53.61	\$71.23
Directional Drill Operator	\$32.34		\$7.50	\$0.97	\$0.32	\$0.00	\$7.76	\$1.00	\$0.00	\$0.00	\$49.89	\$66.06
Groundman 0-12 months Exp	\$25.50		\$7.50	\$0.77	\$0.26	\$0.00	\$6.12	\$1.00	\$0.00	\$0.00	\$41.15	\$53.90
Groundman 0-12 months Exp w/CDL	\$28.15		\$7.50	\$0.84	\$0.28	\$0.00	\$6.76	\$1.00	\$0.00	\$0.00	\$44.53	\$58.60
Groundman 1 yr or more	\$28.15		\$7.50	\$0.84	\$0.28	\$0.00	\$6.76	\$1.00	\$0.00	\$0.00	\$44.53	\$58.60
Groundman 1 yr or more w/CDL	\$33.47		\$7.50	\$1.00	\$0.33	\$0.00	\$8.03	\$1.00	\$0.00	\$0.00	\$51.33	\$68.06
Apprentice	BHR	Percent										
1st 1000 hrs	\$31.54	\$80.00	\$7.50	\$0.95	\$0.32	\$0.00	\$7.57	\$1.00	\$0.00	\$0.00	\$48.88	\$64.65
2nd 1000 hrs	\$33.51	\$85.00	\$7.50	\$1.01	\$0.34	\$0.00	\$8.04	\$1.00	\$0.00	\$0.00	\$51.40	\$68.16
3rd 1000 hrs	\$35.48	\$90.00	\$7.50	\$1.06	\$0.35	\$0.00	\$8.51	\$1.00	\$0.00	\$0.00	\$53.90	\$71.64
4th 1000 hrs	\$37.45	\$95.00	\$7.50	\$1.12	\$0.37	\$0.00	\$8.99	\$1.00	\$0.00	\$0.00	\$56.43	\$75.16

**(\*)Special Calculation Note :**

Other: Health Reimbursement 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 #:**  
LCN01-2025ib

**Craft:**  
Electrical

**Effective Date:**  
12/10/2025

**Effective Date:**  
12/10/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrician	\$39.40		\$8.35	\$10.23	\$0.67	\$0.00	\$4.30	\$0.00	\$0.00	\$0.00	\$62.95	\$82.65
Apprentice	BHR	Percent										
1st Period 0-1000 hrs	\$18.12	\$46.00	\$4.78	\$0.74	\$0.31	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$23.95	\$33.01
2nd Period 1001-2000 hrs	\$18.12	\$46.00	\$4.78	\$0.74	\$0.31	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$23.95	\$33.01
3rd Period 2001-3500 hrs	\$19.70	\$50.00	\$7.73	\$5.12	\$0.33	\$0.00	\$2.15	\$0.00	\$0.00	\$0.00	\$35.03	\$44.88
4th Period 3501-5000 hrs	\$20.49	\$52.00	\$7.75	\$5.32	\$0.35	\$0.00	\$2.24	\$0.00	\$0.00	\$0.00	\$36.15	\$46.39
5th Period 5001-6500 hrs	\$24.43	\$62.00	\$7.88	\$6.34	\$0.42	\$0.00	\$2.67	\$0.00	\$0.00	\$0.00	\$41.74	\$53.95
6th Period 6501-8000 hrs	\$30.34	\$77.00	\$8.06	\$7.88	\$0.52	\$0.00	\$3.31	\$0.00	\$0.00	\$0.00	\$50.11	\$65.28

**(\*)Special Calculation Note :**

**Ratio :**

1-3 Journeymen to 4 Apprentices  
 4-6 Journeymen to 8 Apprentices  
 7-9 Journeymen to 12 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 #:**  
LCN01-2025ib

**Craft:**  
Electrical

**Effective Date:**  
12/10/2025

**Effective Date:**  
12/10/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrical Lightning Rod Technician	\$37.34		\$8.35	\$9.05	\$0.00	\$0.00	\$4.05	\$0.00	\$0.00	\$0.00	\$58.79	\$77.46
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 :**

# Prevailing Wage Rate Skilled Crafts

**Name of Union:** Electrical Local 82 Voice Data Video

**Type of Rate:** Commercial

**Change #:**  
LCN01-2025ib

**Craft:**  
Electrical

**Effective Date:**  
12/10/2025

**Effective Date:**  
12/10/2025

	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	\$29.20		\$7.60	\$9.13	\$0.55	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$46.48	\$61.08
Cable Puller	\$16.06		\$4.20	\$0.48	\$0.31	\$0.00	\$0.25	\$0.00	\$0.00	\$0.00	\$21.30	\$29.33
Apprentice	BHR	Percent										
1st 0-1000 hours	\$17.52	\$60.00	\$4.50	\$5.48	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.83	\$36.59
2nd 1001-2000 hours	\$17.52	\$60.00	\$4.50	\$5.48	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$27.83	\$36.59
3rd 2001-3000 hours	\$18.98	\$65.00	\$7.43	\$5.93	\$0.36	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.70	\$42.19
4th 3001-4000 hours	\$18.98	\$65.00	\$7.43	\$5.93	\$0.36	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.70	\$42.19
5th 4001-5000 hours	\$20.44	\$70.00	\$7.45	\$6.39	\$0.39	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$34.67	\$44.89
6th 5001-6000 hours	\$21.90	\$75.00	\$7.48	\$6.85	\$0.42	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.65	\$47.60
7th 6001-7000 hours	\$23.36	\$80.00	\$7.50	\$7.30	\$0.44	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.60	\$50.28
8th 7001 hours	\$24.82	\$85.00	\$7.53	\$7.75	\$0.47	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.57	\$52.98

**(\*)Special Calculation Note :**

**Ratio :**

- 1-3 Journeymen to 3 Apprentices
- 4-6 Journeymen to 6 Apprentices
- 7-9 Journeymen to 9 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 :**

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 #:**  
LCN01-2026ib

**Craft:**  
Elevator

**Effective Date:**  
3/18/2026

**Effective Date:**  
3/18/2026

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Elevator Mechanic	\$59.92		\$16.37	\$11.06	\$0.85	\$4.79	\$10.70	\$2.26	\$0.00	\$0.00	\$105.95	\$135.91
Apprentice	BHR	Percent										
Probationary Apprentice	\$29.96	\$50.00	\$0.00	\$0.00	\$0.00	\$1.80	\$0.00	\$0.00	\$0.00	\$0.00	\$31.76	\$46.74
1st year	\$32.96	\$55.00	\$16.37	\$11.06	\$0.85	\$1.98	\$10.70	\$1.24	\$0.00	\$0.00	\$75.16	\$91.64
2nd year	\$38.95	\$65.00	\$16.37	\$11.06	\$0.85	\$2.34	\$10.70	\$1.47	\$0.00	\$0.00	\$81.74	\$101.22
3rd year	\$41.94	\$70.00	\$16.37	\$11.06	\$0.85	\$2.52	\$10.70	\$1.58	\$0.00	\$0.00	\$85.02	\$105.99
4th year	\$47.94	\$80.00	\$16.37	\$11.06	\$0.85	\$2.88	\$10.70	\$1.80	\$0.00	\$0.00	\$91.60	\$115.57
Helper	\$41.94	\$70.00	\$16.37	\$11.06	\$0.85	\$3.36	\$10.70	\$1.58	\$0.00	\$0.00	\$85.86	\$106.83
Assistant Mechanic	\$47.94	\$80.00	\$16.37	\$11.06	\$0.85	\$3.82	\$10.70	\$1.80	\$0.00	\$0.00	\$92.54	\$116.51

**(\*)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 #:**  
LCN01-2025ib

**Craft:**  
Glazier

**Effective Date:**  
11/19/2025

**Effective Date:**  
11/19/2025

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Glazier	\$35.85		\$6.80	\$12.30	\$0.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$55.40	\$73.33
Apprentice	BHR	Percent										
1st Year	\$23.30	\$65.00	\$6.80	\$8.85	\$0.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.40	\$51.05
2nd Year	\$26.89	\$75.00	\$6.80	\$9.84	\$0.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.98	\$57.42
3rd Year	\$30.47	\$85.00	\$6.80	\$10.82	\$0.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$48.54	\$63.77
4th Year	\$34.06	\$95.00	\$6.80	\$11.81	\$0.45	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$53.12	\$70.15

**(\*)Special Calculation Note :**

No special calculations for this skilled craft wage rate are required at this time.

**Ratio :**

1 Journeyman 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 #:**  
LCN01-2025ib

**Craft:**  
Ironworker

**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 (*)		
Classification											
Ironworker Structural	\$37.39		\$9.50	\$9.50	\$0.85	\$0.00	\$5.50	\$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	\$62.74	\$81.44
Fence Erector	\$37.39		\$9.50	\$9.50	\$0.85	\$0.00	\$5.50	\$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	\$62.74	\$81.44
Machinery Mover	\$37.39		\$9.50	\$9.50	\$0.85	\$0.00	\$5.50	\$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	\$62.74	\$81.44
Metal Building Erector	\$37.39		\$9.50	\$9.50	\$0.85	\$0.00	\$5.50	\$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	\$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	\$47.78	\$59.74
2nd Year	\$27.67	\$74.00	\$9.50	\$9.50	\$0.85	\$0.00	\$4.00	\$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	\$55.26	\$70.96
4th Year	\$35.15	\$94.00	\$9.50	\$9.50	\$0.85	\$0.00	\$4.00	\$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 portions 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 "corruforn" 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 #:**  
LCN01-2026ib

**Craft:**  
Laborer

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Laborer Group 1	\$38.77		\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$55.87	\$75.25
Group 2	\$38.94		\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$56.04	\$75.51
Group 3	\$39.27		\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$56.37	\$76.00
Group 4	\$39.72		\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$56.82	\$76.68
Watch Person	\$33.50		\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$50.60	\$67.35
Apprentice	BHR	Percent										
0-1000 hrs	\$31.02	\$80.00	\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$48.12	\$63.63
1001-2000 hrs	\$32.95	\$85.00	\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$50.05	\$66.53
2001-3000 hrs	\$34.89	\$90.00	\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$51.99	\$69.44
3001-4000 hrs	\$36.83	\$95.00	\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$53.93	\$72.34
More than 4000 hrs	\$38.77	\$100.00	\$9.45	\$4.60	\$0.45	\$0.00	\$2.50	\$0.00	\$0.10	\$0.00	\$55.87	\$75.25

**(\*)Special Calculation Note :**

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 Journeyman to 1 Apprentice
- 3 Journeymen to 1 Apprentice thereafter

Watchmen have no Apprentices

**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 perform work as per the October 31, 1949, memorandum on concrete forms, by and between the United Brotherhood of Carpenters and Joiners of America 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 members 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), Yarnier, 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, Guniting 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 #:**  
LCN01-2026ib

**Craft:**  
Laborer

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Laborer Group 1	\$33.40		\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$49.20	\$65.90
Group 2	\$34.00		\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$49.80	\$66.80
Group 3	\$34.50		\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$50.30	\$67.55
Apprentice	BHR	Percent										
Building Laborer 1-1000 hrs	\$26.72	\$80.00	\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$42.52	\$55.88
1001-2000	\$28.39	\$85.00	\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$44.19	\$58.38
2001-3000	\$30.06	\$90.00	\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$45.86	\$60.89
3001-4000	\$31.73	\$95.00	\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$47.53	\$63.39
More than 4000 hrs	\$33.40	\$100.00	\$9.45	\$4.60	\$0.40	\$0.00	\$1.25	\$0.00	\$0.10	\$0.00	\$49.20	\$65.90

**(\*)Special Calculation Note :**

\$0.10 LECET is for Labor Management.

**Ratio :**

1 Journeyman to 1 Apprentice  
4 Journeymen to 1 Apprentice thereafter

**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 #:**  
LCN01-2026ib

**Craft:**  
Operating Engineer

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Operator Group A	\$47.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$64.74	\$88.39
Operator Group B	\$47.17		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$64.62	\$88.20
Operator Group C	\$46.13		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$63.58	\$86.65
Operator Group D	\$44.95		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$62.40	\$84.88
Operator Group E	\$39.49		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$56.94	\$76.69
Master Mechanic	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Lift Director	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Cranes & Mobile Concrete Pumps 150'-180'	\$47.79		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.24	\$89.14
Cranes & Mobile Concrete Pumps 180'-249'	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Cranes & Mobile Concrete Pumps 249' and over	\$48.54		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.99	\$90.26
Apprentice	BHR	Percent										
1st Year	\$23.65	\$50.02	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$41.10	\$52.92
2nd Year	\$28.37	\$60.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$45.82	\$60.00
3rd Year	\$33.10	\$70.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$50.55	\$67.10
4th Year	\$37.83	\$80.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$55.28	\$74.19
Field Mechanic Trainee	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1st Year	\$28.37	\$60.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$45.72	\$59.91
2nd Year	\$33.10	\$70.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$50.45	\$67.00
3rd Year	\$37.83	\$80.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.18	\$74.09
4th Year	\$42.56	\$90.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$59.91	\$81.19

**(\*)Special Calculation Note :**

Other: Education & Safety  
Misc: National Training

Note: There will be a 10% increase for the apprentices on top of the percentages listed above provided they are operating mobile equipment.

**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 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 :**

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); Horizontal 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; Cleoplanes; 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; Guniting 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 #:**  
LCN01-2026ib

**Craft:**  
Operating Engineer

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Operator Class A	\$47.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$64.74	\$88.39
Operator Class B	\$47.17		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$64.62	\$88.20
Operator Class C	\$46.13		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$63.58	\$86.65
Operator Class D	\$44.95		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$62.40	\$84.88
Operator Class E	\$39.49		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$56.94	\$76.69
Master Mechanic	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Lift Director	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Crane and Mobile Concrete Pump 150' - 179'	\$47.79		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.24	\$89.14
Crane and Mobile Concrete Pump 180' - 249'	\$48.29		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.74	\$89.89
Crane and Mobile Concrete Pump 250' and Ove	\$48.54		\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$65.99	\$90.26
Apprentice	BHR	Percent										
1st Year	\$23.64	\$50.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$41.09	\$52.91
2nd Year	\$28.37	\$60.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$45.82	\$60.00
3rd Year	\$33.10	\$70.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$50.55	\$67.10
4th Year	\$37.83	\$80.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.10	\$55.28	\$74.19
Field Mech Trainee	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1st year	\$28.37	\$60.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$45.72	\$59.91
2nd year	\$33.10	\$70.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$50.45	\$67.00
3rd year	\$37.83	\$80.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.18	\$74.09
4th year	\$42.56	\$90.00	\$10.01	\$6.25	\$1.00	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$59.91	\$81.19

**(\*)Special Calculation Note :**

Other: Education & Safety Fund  
Misc: National Training

\*\*Apprentices will receive a 10% increase on top of the percentages listed above provided they are operating mobile equipment.

**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 :**

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 #:**  
LCN01-2025ib

**Craft:**  
Painter

**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												
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 #:**  
LCN01-2025ib

**Craft:**  
Painter

**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												
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 #: LCN01-2025ib

Craft: Painter

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												
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, Containm ent 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 Reclamati on, 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/P ower 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/Q uality Assurance , Traffic safety, Competen t 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 Probation ary	\$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 #:**  
LCN01-2025ib

**Craft:**  
Painter

**Effective Date:**  
6/18/2025

**Effective Date:**  
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 #:**  
LCN01-2025ib

**Craft:**  
Painter

**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											
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 Fabricator/ 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 Fabricator/ 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 #:**  
LCN01-2024ib

**Craft:**  
Roofer

**Effective Date:**  
12/24/2024

**Effective Date:**  
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
4th Term 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 #:**  
LCN01-2025ib

**Craft:**  
Sheet Metal Worker

**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												
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	\$100.50
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 #:**  
LCN01-2026ib

**Craft:**  
Truck Driver

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	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	\$34.90		\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$55.75	\$73.20
Apprentice	BHR	Percent										
First 6 months	\$27.92	\$80.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$48.77	\$62.73
7-12 months	\$29.67	\$85.02	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$50.52	\$65.36
13-18 months	\$31.41	\$90.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$52.26	\$67.97
19-24 months	\$33.16	\$95.02	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$54.01	\$70.59
25-30 months	\$34.90	\$100.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$55.75	\$73.20

**(\*)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 #:**  
LCN01-2026ib

**Craft:**  
Truck Driver

**Effective Date:**  
5/1/2026

**Effective Date:**  
5/1/2026

	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	\$35.91		\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$56.76	\$74.72
Apprentice	BHR	Percent										
First 6 months	\$28.72	\$79.99	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$49.57	\$63.93
7-12 months	\$30.52	\$85.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$51.37	\$66.63
13-18 months	\$32.32	\$90.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$53.17	\$69.33
19-24 months	\$34.11	\$95.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$54.96	\$72.02
25-30 months	\$35.91	\$100.00	\$10.75	\$9.60	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$56.76	\$74.72

**(\*)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.