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MEMBER OF ACEC INDIANA

BF&S CIVIL ENGINEERS

INDIANAPOLIS | LAFAYETTE | MERRILLVILLE
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**DARKE COUNTY AIRPORT – VERSAILES, OHIO**
**CONSTRUCT/EXPAND HANGAR**
**AIP PROJECT NO. AIP 3-39-0082-023/024-2025**

# ADDENDUM NO. 1
# TO
# PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS

April 1, 2025

Notice of this Addendum is being sent via email to all bidders:

**ITEM NO. 1** The due date for bids has been moved to **1:00pm (local time) on the 10th day of April, 2025** and then be publicly opened and read aloud at 1:30pm.

**ITEM NO. 2** Clarification: The Basis of Award will be made on the largest hangar size that fits the county's budget and aligns with funding opportunities from the FAA.

**ITEM NO. 3** Current plan holder list attached.

**ITEM NO. 4** Question: Does the 12'x12' door include a powered operator.

Answer: Yes, an operator properly sized for the door shall be provided.

**ITEM NO. 5** Question: Is there a geotechnical engineering report available?

Answer: See attached report from a previous project.

**ITEM NO. 6** Question: Is a financial report required?

Answer: No, proof of prequalification with Ohio Department of Transportation can be submitted in lieu of financial reports.

**ITEM NO. 7** Question: When were you thinking the NTP would be? I see the completion date is 140 days after. I am concerned with the lead time of a PEMB and being able to hit this deadline.

Answer: Our intent would be to not issue NTP until the building is ordered. We can also pause contract time if the contractor wanted to get site work done, then pause until building delivery. We are very flexible on time as long as progress is being made. With this being FAA funded, unfortunately we can't issue a contract until the FAA grant offer is received. We do not know how fast the grant offer will come due to federal uncertainty currently.

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**ITEM NO. 8** Question: Can you provide the height clearance needed for the building?

Answer: The building shall be tall enough to accommodate a 26-foot height clear opening door. Nothing shall be less than 26 feet off the floor.

**ITEM NO. 9** Question: Are there any owner furnished materials?

Answer: No, with exception of the propane tank.

**ITEM NO. 10** Question: How about the propane tank? Is this owner purchased or contractor purchased?

Answer: The county will secure the propane tank.

**ITEM NO. 11** Question: Time extension: Can we get 10 days additional for bidding?

Answer: See Item No. 1 above. To meet FAA grant application deadlines only 7 additional days can be allowed.

**ITEM NO. 12** Question: DBE Requirements: Are these required or project goals?

Answer: The DBE program is a requirement when utilizing FAA funding. If the bidder does not propose to meet the project goal, Good Faith Effort (GFE) documentation must be submitted. See Page 4 of the Instructions to Bidders for additional information.

**ITEM NO. 13** Clarification: The Itemized Proposal has been revised and the alternate items for Tube Style Propane Radiant Heat has been removed. Contractors shall submit revised Itemized Proposal with their bids.

**ITEM NO. 14** Question: Is 3 phase power available?

Answer: There is no 3 phase power at or near the Darke County Airport.

BUTLER, FAIRMAN AND SEUFERT, INC.

Jason R. Clearwaters, PE, PS
Aviation Development Director

Please acknowledge receipt of this Addendum in the Proposal, ACKNOWLEDGEMENTS BY BIDDER, page P-4.

PSI Project Number: 01051601
June 18, 2020

Professional Service Industries, Inc.
5599 Webster Street, Dayton, OH 45414
Phone: (937) 898-1200
Fax: (937) 898-1230

June 18, 2020

Mr. Benjamin Cooley, PE, Project Manager
Crawford, Murphy & Tilly, Inc.
8101 North High St.
Suite 150
Columbus, Ohio 43235

Re: **Geotechnical Exploration Report**
**Parallel Taxiway to Runway 9/27 and West Apron Terminal**
**Darke County Airport**
**9724 OH-121**
**Versailles, Ohio 45380**

Dear Mr. Cooley:

Per your request, **Professional Service Industries, Inc. (PSI), an Intertek Company**, is pleased to submit this Geotechnical Exploration Report for the proposed E Parallel Taxiway to Runway 9/27 and West Apron Terminal project located at the Darke County Airport at 9724 OH-121 in Versailles, Ohio. Included in this report are the results of the geotechnical exploration and recommendations concerning the design and construction of the taxiway and apron terminal.

**It is considered imperative that the geotechnical engineer and/or their representative be present during earthwork operations and pavement installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be held responsible for interpretations and field quality control observations made by others.**

We appreciate the opportunity to have provided you with our geotechnical engineering services and look forward to participation in the construction phase of this project. If you have any questions concerning this report or if we may be of further service in any manner, please contact our office.

Respectfully submitted,
**PROFESSIONAL SERVICE INDUSTRIES, INC.**


R. Andrew Schlarman II, P.E.
Project Manager

Alagaiya Veeramani, P.E.
Chief Engineer/Principal Consultant



Enclosures

# Geotechnical Exploration Report

**of**

**Parallel Taxiway to Runway 9/27 and West Apron Terminal**
**Darke County Airport**
**9724 OH-121**
**Versailles, Ohio 45380**

**Prepared for**

**Crawford, Murphy & Tilly, Inc.**
**8101 North High St.**
**Suite 150**
**Columbus, Ohio 43235**

**Prepared by**

**Professional Service Industries, Inc.**
**5599 Webster Street**
**Dayton, Ohio 45414**

**June 18, 2020**

**PSI Project No. 01051601**

# TABLE OF CONTENTS

# 1 PROJECT INFORMATION

## 1.1 PROJECT AUTHORIZATION

The following table summarizes, in chronological order, the Project Authorization History for the services performed and represented in this report by Professional Service Industries, Inc. (PSI).

| PROJECT TITLE: PARALLEL TAXIWAY TO RUNWAY 9/27 AND WEST APRON TERMINAL – VERSAILLES, OHIO | | |
|---|---|---|
| **Document and Reference Number** | **Date** | **Requested/Provided By** |
| Request for Proposal | 5/12/2020 | Email Request for Proposal from Mr. Ben Cooley of CMT |
| PSI Quotation No.: 0105-310925 | 5/15/2020 | Mr. R. Andrew Schlarman II, P.E., and Mr. Alagaiya Veeramani, P.E., of PSI |
| Signed Subconsultant Agreement | 5/18/2020 | Mr. Greg Heaton, Vice President of CMT and Mr. R. Andrew Schlarman II, Branch Manager of PSI |

## 1.2 PROJECT DESCRIPTION

The following table lists the material and information provided for this project:

| DESCRIPTION OF MATERIAL | PROVIDER/SOURCE | DATE |
|---|---|---|
| A request for proposal document dated May 12, 2020 outlining the project scope of work with an attachment titled, "*Geotechnical Exhibit*" dated 5/12/2020 showing an aerial of the proposed development and client-requested boring locations. | Mr. Benjamin Cooley, P.E. / CMT | 5/12/2020 |

Based on the information provided, PSI understands the project will involve construction of new taxiway parallel to the existing 9/27 runway and a terminal apron at the Darke County Airport in Versailles, Ohio. The new taxiway will be located approximately 250 feet to the north and span the full length of the existing 9/27 runway. The terminal apron will be located to the west of the existing storage building. No specific design information was provided at the time of this report. **what's the length & width of the taxiway??

Additionally, no topographical information was provided at the time of this report. However, based on information from Google Earth™, the terrain is rolling within the field and elevations range from approximately 1,004 to 1,009 feet within the proposed taxiway area. Based on the apparent difference in elevation of the existing taxiway and adjacent field, PSI has estimated maximum cut/fill operations of approximately 2 to 3 feet will be required to reach final grades.

The geotechnical recommendations presented in this report are based on the available project information for the proposed construction and the subsurface materials described in this report. If any of the information noted above is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this

report if appropriate and if desired by the client. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

## 1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site and to prepare recommendations for the proposed development. PSI's contracted scope of services included drilling twelve (12) soil test borings within the proposed taxiway and apron terminal to depths of approximately 10 feet each below the existing surface grades, select laboratory testing, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- A general assessment of area geology based on our local knowledge and study of available geological literature
- Site preparation as needed for support of the new pavement
- General location, description of materials encountered in the borings which may interfere with construction progress or structure performance, including existing fills, cobbles/boulders, or organic soils
- Identification of water levels encountered at the time of drilling
- Recommendation of modulus of subgrade reaction, and analysis of the swell potential of surface soil based on index tests
- Recommendations for fill including the selection of materials for use and procedures for placement
- Results of re-molded CBR tests for each of the primary subgrade soils encountered
- Recommendations for pavement drainage

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on, below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

PSI's scope also did not provide any service to investigate or detect the presence of moisture, mold or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. Client should be aware that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. The client should be aware that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.

## 1.4 SITE LOCATION AND DESCRIPTION

The proposed project site is located within the Darke County Airport at 9724 OH-121 in Versailles, Darke County, Ohio. The site latitude and longitude are approximately 40.2053° N and 84.5315° W, respectively. Specifically, the new taxiway will be in a tilled, agricultural field approximately 250 feet to the north and span the full length of the existing 9/27 runway. The terminal apron will be located to the west of the existing storage buildings.

No topographical information was provided at the time of this report. However, based on information from Google Earth™, the terrain is rolling within the field and elevations range from approximately 1,004 to 1,009 feet within the proposed taxiway area. The site drainage appears to be through surface runoff and infiltration.

## 1.5 SITE GEOLOGY

Based on the on-line geologic map provided by the Ohio Geological Survey (available at http://www.dnr.state.oh.us/OhioGeologicalSurvey/SurficialGeology/tabid/23586/Default.aspx), the proposed site area is located in the Central Lowland Province, Central Ohio Clayey Till Plain Region with predominately ground moraine and ridge moraine topography underlain by Silurian age bedrock (as part of the Wisconsinan Glaciation Period).

## 1.6 SUBSURFACE CONDITIONS

The site subsurface conditions were explored with twelve (12) soil test borings within the proposed taxiway and apron terminal to depths of approximately 10 feet each below the existing surface grades. The boring locations and depths were selected by CMT and reviewed by the PSI prior to drilling activities. PSI personnel staked the borings in the field by utilizing a handheld GPS unit. Elevations noted in the boring logs in the *Appendix* of this report were interpolated from the topographical information provided on Google Earth™. The actual boring locations and elevations should be surveyed prior to construction activities.

The borings were advanced utilizing 2-¼ inch inside diameter, hollow-stem auger. Soil samples were routinely obtained during the drilling process. Selected soil samples were later tested in the laboratory to obtain soil material properties for the foundation recommendations. Drilling, sampling, and laboratory testing was accomplished in general accordance with ASTM procedures.

SURFACE MATERIALS: The surface materials at the soil test borings consisted of approximate 12 inches of topsoil. In tilled zones, such as at this site, the topsoil thicknesses should be expected to be widely variable between the boring locations.

NATURAL SOILS: Beneath the surface materials, natural soils consisting of Lean Clay (CL) and **Fat Clay (CH)** were encountered. Traces of fine roots were noted in some of the upper soils at the boring locations. The natural soils extended to the termination depths of the borings and exhibited Standard Penetration test values ($N_{60}$-values) ranging from 6 to 55 blows per foot (bpf) and moisture contents ranging from 11 to 30 percent.

The following table briefly summarizes the range of results from the field and laboratory testing programs. Please refer to the attached boring logs and laboratory data sheets for more specific information:

**Table 1**
**Summary of SPT $N_{60}$ Values, Moisture Content and Groundwater Levels**

| Top of Soil Sampling Depth (ft) | SPT N Values (Blows/ft) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B-01 | B-02 | B-03 | B-04 | B-05 | B-06 | B-07 | B-08 | B-09 | B-10 | B-11 | B-12 | Average |
| 1.0 | 10 | 7 | 7 | 12 | 9 | 6 | 7 | 7 | 9 | 12 | 6 | 10 | ***9*** |
| 3.5 | 16 | 10 | 17 | 25 | 14 | 9 | 26 | 33 | 13 | 30 | 16 | 30 | ***20*** |
| 6.0 | 17 | 12 | 25 | 27 | 25 | 20 | 23 | 27 | 19 | 30 | 26 | 25 | ***23*** |
| 8.5 | 45 | 43 | 52 | 38 | 55 | 35 | 45 | 43 | 51 | 36 | 39 | 36 | ***43*** |

| Top of Soil Sampling Depth (ft) | Moisture Content (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B-01 | B-02 | B-03 | B-04 | B-05 | B-06 | B-07 | B-08 | B-09 | B-10 | B-11 | B-12 | Average |
| 1.0 | 24 | 26 | 23 | 16 | 26 | 29 | 24 | 21 | 24 | 15 | 24 | 24 | ***23*** |
| 3.5 | 18 | 26 | 14 | 15 | 17 | 30 | 14 | 16 | 16 | 14 | 15 | 15 | ***18*** |
| 6.0 | 13 | 16 | 17 | 16 | 11 | 16 | 13 | 16 | 16 | 15 | 16 | 17 | ***15*** |
| 8.5 | 16 | 14 | 12 | 15 | 17 | 15 | 15 | 16 | 15 | 16 | 15 | 17 | ***15*** |

| Groundwater Level Reading and Borehole Caving Depth (ft) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Level Encountered While Drilling | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | |
| Water Level Reading Encountered Upon Completion | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | |
| Cave Depth of Boring Upon Completion | 6.0 | 7.0 | 7.5 | 7.0 | 7.0 | 7.0 | 7.5 | 6.0 | 7.0 | 6.0 | 6.0 | 6.0 | |

- Fat Clay
- Fat Clay/High Plasticity Lean Clay

NE- Not Encountered

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the *Appendix* should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, penetration resistances, and locations of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these boring logs. The samples that were not altered by laboratory testing will be retained for sixty (60) days from the date of this report and then will be discarded

## 1.7 LABORATORY TEST RESULTS

### 1.7.1 CALIFORNIA BEARING RATIO (CBR)

Representative bulk samples were obtained during field drilling operations to determine the laboratory CBR value of the anticipated subgrade soils. The bulk samples were obtained as composite samples from the auger cuttings at soil test borings B-01 through B-12 between depths of 1 to 3 feet and 3 to 5 feet below existing surface grades at each boring location. The samples were prepared and tested for its maximum density and optimum moisture content followed by the CBR test in accordance with the applicable ASTM procedures. The laboratory test results are summarized in the following tables:

**Table 2**
**Soil Index Tests**

| Sample No. | Sample Depth (feet) | Maximum Dry Density (pcf) | Optimum Moisture (%) | CBR (0.2 inches) |
|---|---|---|---|---|
| S-1 | 1 to 3 | 104.6 | 20.1 | 4.7 |
| S-2 | 3 to 5 | 106.1 | 17.8 | 4.5 |

### 1.7.2 ADDITIONAL LABORATORY TESTING

Laboratory testing was performed on representative split-spoon samples obtained during drilling. The laboratory tests included natural moisture content, grain size analysis and Atterberg Limits. The laboratory test results are summarized in the following tables:

**Table 3**
**Soil Index Tests**

| Boring No. | Sample Depth (feet) | Liquid Limit | Plastic Limit | Plasticity Index | Moisture Content |
|---|---|---|---|---|---|
| B-02 | 1 to 2-1/2 | 56 | 22 | 34 | 26 |
| B-05 | 3-1/2 to 5 | 35 | 18 | 17 | 17 |
| B-08 | 6 to 7-1/2 | 26 | 15 | 11 | 16 |
| B-10 | 1 to 2-1/2 | 31 | 18 | 13 | 15 |
| B-12 | 3-1/2 to 5 | 34 | 17 | 17 | 15 |

**Table 4**
**Soil Grain Size Analysis**

| Boring No. | Sample Depth (feet) | Gravel % | Sand % | Silt and Clay % |
|---|---|---|---|---|
| B-02 | 1 to 2-1/2 | 0.0 | 15.5 | 84.5 |
| B-05 | 3-1/2 to 5 | 4.2 | 17.9 | 77.9 |
| B-08 | 6 to 7-1/2 | 1.2 | 21.8 | 77.0 |
| B-10 | 1 to 2-1/2 | 2.0 | 23.3 | 74.7 |
| B-12 | 3-1/2 to 5 | 3.0 | 21.6 | 75.4 |

The forgoing tables are summaries of the field and laboratory data. Please refer to the boring logs and laboratory data sheets for specific information found in the appendix of this report.

## 1.8 WATER LEVEL MEASUREMENTS

No groundwater was observed during or upon completion of drilling operations at the soil test borings. However, it must be recognized that free groundwater levels can significantly fluctuate (seasonally) as a function of rainfall. During a time of year or weather different from the time of drilling, there may be a considerable change in the water table, or the occurrence of water where not previously encountered. Furthermore, the free groundwater levels in the boreholes often are not representative of the actual groundwater level, because the boreholes remain open for a relatively short time. To obtain longer-term measurements, it is necessary to install water level observation wells or piezometers. The water level measurements presented in this report are the levels that were measured at the time of PSI's field activities. Therefore, we recommend that the contractor determine the actual groundwater levels at the time of construction to evaluate groundwater impact on the construction procedures.

# 2 GEOTECHNICAL EVALUATION

## 2.1 GEOTECHNICAL DISCUSSION

There are two (2) geotechnical-related issues at this site which will affect design and performance of the proposed development. The following summarizes these concerns:

1. **High plasticity "Fat" clays were encountered in the exploration that could require remediation.**
2. **If necessary, aeration and drying of some of the wetter on-site natural soils may be required during site grading and compacting operations. Reducing the moisture content of the clay/silt soils may be necessary to achieve proper compaction and establish stable subgrade conditions.**

## 2.2 HIGH PLASTICITY CLAYS

High plasticity "fat" clays are present in the project area that may expand and shrink thereby impacting the proposed construction. Fat clays have the potential for volume change with changes in the soil moisture content. Subgrade soils that are destabilized by construction activity or by excessive moisture should be excavated and replaced with properly compacted soils or should be stabilized in-situ via chemical modification if possible. The use of chemical modification can also have the added benefit of increasing the strength characteristics and improving subgrade stability during construction.

## 2.3 SOIL COMPACTION

Since this site contains some fine-grained clay soils, during periods of wet weather or decreased drying time (such as the spring and fall) it may become difficult to achieve the desired compaction of the soils due to high moisture contents. The soils may need to be scarified and dried to a moisture content that will facilitate compaction in accordance with the structural fill requirements of this report. **Lime, kiln dust, or fly ash stabilization may be necessary to expedite the work and achieve the required level of soil compaction.**

# 3 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical related recommendations have been developed based on the subsurface conditions encountered and PSI's understanding of the proposed construction. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to our recommendations will be required.

## 3.1 SITE PREPARATION

PSI recommends that the topsoil, organic soil, vegetation, soft, frozen soil, high-plasticity clay, and any other unsuitable materials in the construction areas be stripped and removed from the proposed taxiway pavement areas. Topsoil and organic soil may be stockpiled for use in landscaping areas. Based on PSI's test borings, a stripping depth of approximately 12 inches is anticipated to remove existing topsoil. Please note that there may be variable in stripping depths due to variations in the topsoil thickness in the tilled agricultural field or the presence of high-plasticity clay soils. The stripping of high-plasticity clay can be avoided if chemical subgrade modification is used as discussed in the subsequent paragraphs. A representative of the geotechnical engineer should determine and document the depth of removal at the time of construction.

In this region, otherwise competent clays can undergo a significant loss of stability when construction activities are performed during wetter portions of the year. PSI anticipates that the soils in the project area can become easily disturbed if subjected to conventional rubber tire or narrow track-type equipment. Soils that become disturbed would need to be excavated and replaced; however, this remedial excavation may expose progressively wetter soils with depth, thus compounding the problem condition. Thus, a normal approach to subgrade preparation may not be possible. Appropriate wide-track equipment selection should aid in minimizing potential disturbance.

**After stripping to the proposed subgrade levels, the taxiway and apron terminal area should be proof-rolled with a loaded tandem axle dump truck or similar heavy rubber-tired vehicle (typically with an axial load greater than nine (9) tons). Soils that are observed to rut or deflect excessively (typically greater than one (1) inch) under the moving load should be undercut and replaced with properly compacted low plasticity fill material.** The proof-rolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. Care should be taken during construction activities not to allow excessive drying or wetting of exposed soils. The subgrade soils should be scarified and compacted to at least 98% of the materials' standard Proctor maximum dry density, in general accordance with ASTM procedures, to a depth of at least twelve (12) inches below the surface. New fill for building structures, asphalt, and concrete should not be placed on frozen ground.

After subgrade preparation and observation have been completed, fill placement required to establish grade may begin. **Low-plasticity structural fill materials placed beneath the structural features or slabs should be free of organic or other deleterious materials and have a maximum particle size of less than three (3) inches. Low-plasticity soils are defined as having a liquid limit less than forty-five (45) and plasticity index less than twenty (20). The in-situ soils appear to be suitable for reuse as engineered fill if they are free of any objectionable material and meet the requirements outlined in this report. Fat Clay (CH) soils should not be used as structural fill.** A representative of PSI should be on-site to observe, test, and document the placement of the fill. If the fill is too dry, water should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Close moisture content control will be required to achieve the recommended degree of compaction. If wet or cool season earthwork is necessary, PSI recommends the use of imported fill materials meeting the requirements of Ohio Department of Transportation (ODOT) No. 304 aggregate.

In areas where high-plasticity clay is present within 18 inches of final subgrade elevation, PSI recommends the removal of the high-plasticity clay and replacing it with properly compacted and tested low-plasticity fill materials or chemically stabilizing the high-plasticity soils with hydrated lime, cement kiln dust, or other FAA approved material. Fill should be placed in maximum loose lifts of eight (8) inches and compacted to at least 98% of the materials' standard Proctor maximum dry density, and within a range of the optimum moisture content as determined in general accordance with ASTM procedures. Each lift of compacted-engineered fill should be tested and documented by a representative of the geotechnical engineer prior to placement of subsequent lifts. The edges of compacted fill should extend a minimum of 5 feet beyond the proposed pavement edge, or a distance equal to the depth of fill beneath the pavement, whichever is greater. Tested fill materials that do not achieve either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of that area should be performed after the Contractor performs remedial measures.

In utility trenches, shallow foundation excavations, and other areas where large compaction equipment cannot be used, granular engineered fill should be placed as backfill. PSI recommends the use of material meeting Ohio Department of Transportation (ODOT) No. 304, for use as granular engineered fill. Engineered fill should be placed in accordance with the recommendations stated in this section of the report.

The fill placed should be tested and documented by a geotechnical technician and directed by a geotechnical engineer to evaluate the placement of fill material. It should be noted that the geotechnical engineer of record can only certify the testing that is performed, and the work observed by that engineer or staff in direct report to that engineer.

## 3.2 PAVEMENT RECOMMENDATIONS

In designing the proposed airport taxiways, the existing subgrade conditions must be considered together with the expected traffic use and loading conditions. The subgrade bearing value is typically represented by a California Bearing Ratio (CBR) for the design of flexible pavements, or a Modulus of Subgrade Reaction (k) for rigid pavements. Based on the results of laboratory CBR testing performed on samples collected from the proposed taxiway areas, **a CBR value of 4.0** is recommended for the medium to high plasticity clay soils in the vicinity of the proposed taxiways. This CBR value is valid for standard subgrade preparation and compaction, without any lime stabilization or chemical modification. With the use of soil stabilizing agents, CBR values in the range of 7 to 10 can likely be achieved.

## 3.3 PAVEMENT SUBGRADE PREPARATION

PSI recommends that the moisture content of the subgrade should be maintained between –2% and +3% of the optimum at the time of paving. It may require rework when the subgrade is either excessively desiccated or excessively wet. The placement and compaction of fill material, which will be needed to establish the required pavement grades, must be performed in accordance with the procedures outlined in this report, and in accordance with FAA specifications and guidelines. PSI recommends that the edges of compacted fill should extend at least 5 feet beyond the edges of the proposed pavement, or a distance equal to the depth of fill beneath the pavement, whichever is greater. Construction traffic over compacted fill or prepared subgrades should be minimized to prevent unnecessary disturbance of the subgrade soils. Subgrade soil that becomes destabilized, as verified by PSI, should be removed and replaced with properly compacted fill, or stabilized in-situ via chemical modification/ stabilization.

## 3.4 FAA FROST SUSCEPTIBILITY

The frost susceptibility of the soil is primarily dependent on the grain size of the soil and the distribution of voids within the soil mass. Table 2-2 of the FAA specification AC-150, places soils into one of four Frost Groups based on the percentage of soil particles finer than 0.02 mm by weight. Based on PSI's test borings and limited laboratory testing, the soils at this site are classified as low-plasticity clay (CL) and high-plasticity clay (CH), with Plasticity Indices greater than 12. Therefore, the soil in the vicinity of the proposed taxiways are within FAA Frost Group FG-3.

## 3.5 PAVEMENT DRAINAGE & MAINTENANCE

PSI recommends pavements be sloped to provide rapid surface drainage. Water ponding on or adjacent to the taxiways could saturate and destabilize the subgrade and could cause premature deterioration of the pavement. PSI recommends that underdrains be incorporated into the pavement design to collect and remove water from the granular subbase material. Whenever possible, pavement underdrains should be connected into the airport storm drainage system.

## 3.6 UTILITIES TRENCHING

Excavation for utility trenches shall be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. It should be noted that utility trench excavations have the potential to degrade the properties of the adjacent fill materials. Utility trench walls that can move laterally can lead to reduced bearing capacity and increased settlement of adjacent structural elements and overlying slabs.

Backfill for utility trenches is as important as the original subgrade preparation or structural fill placed to support either a foundation or slab. Therefore, it is imperative that the backfill for utility trenches be placed to meet the project specifications for the structural fill of this project. PSI recommends that granular-based fill, flowable fill or lean mix concrete be utilized for utility trench backfill. If on-site soils are placed as trench backfill, the backfill for the utility trenches should be placed in four (4) to six (6) inch loose lifts and compacted to a minimum of 98% of the maximum dry density achieved by the standard Proctor test. The backfill soil should be moisture conditioned to be within 2% of the optimum moisture content as determined by the standard Proctor test. Up to four (4) inches of bedding material placed directly under the pipes or conduits placed in the utility trench can be compacted to the 98% compaction criteria with respect to the standard Proctor. Compaction testing should be performed for every 200 cubic yards of backfill place or each lift within 150 linear feet of trench, whichever is less. Backfill of utility trenches should not be performed with water standing in the trench. If granular material is used for the backfill of the utility trench, the granular material should have a gradation that will filter protect the backfill material from the adjacent soils. If this gradation is not available, a geosynthetic non-woven filter fabric should be used to reduce the potential for the migration of fines into the backfill material. Granular backfill material shall be compacted to meet the above compaction criteria. The clean granular backfill material should be compacted to achieve a relative density greater than 75% or as specified by the geotechnical engineer for the specific material used.

## 3.7 SILTATION CONTROL

The Clean Water Act implemented in 1990 includes a federal permit program called the National Pollutant Discharge Elimination System (NPDES). This program requires that projects sites in excess of one (1) acre or are part of a development which exceeds one (1) acre be covered under a permit. This typically includes the development of a storm water pollution prevention plan (SWPPP) as well as period inspections (typically once a week plus after significant rainfall). PSI is available to assist with these services.

# 4 CONSTRUCTION CONSIDERATIONS

PSI should be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. PSI cannot accept responsibility for conditions that deviate from those described in this report, nor for the performance of the foundation system if not engaged to also provide construction observation and testing for this project.

## 4.1 MOISTURE SENSITIVE SOILS/WEATHER RELATED CONCERNS

The upper fine-grained soils encountered at this site, especially the high-plasticity clays, will be sensitive to disturbances caused by construction traffic and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and pavement construction activities during dry weather.

## 4.2 DRAINAGE AND GROUNDWATER CONSIDERATIONS

No groundwater was encountered during drilling or upon completion of drilling at the test boring locations. However, PSI recommends that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the pavement excavation, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the pavement areas.

Overall site area drainage is to be arranged in a manner such that the possibility of water impounding below pavement areas, is prevented at all times during and after construction.

## 4.3 EXCAVATION SAFETY

In Federal Register, Volume 54, Number 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better enhance the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is PSI's understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations. A trench safety plan was beyond the scope of our services for this project.

# 5 GEOTECHNICAL RISK

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason is the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding section constitutes PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

# 6 REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by Crawford, Murphy & Tilly, Inc. If there are revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

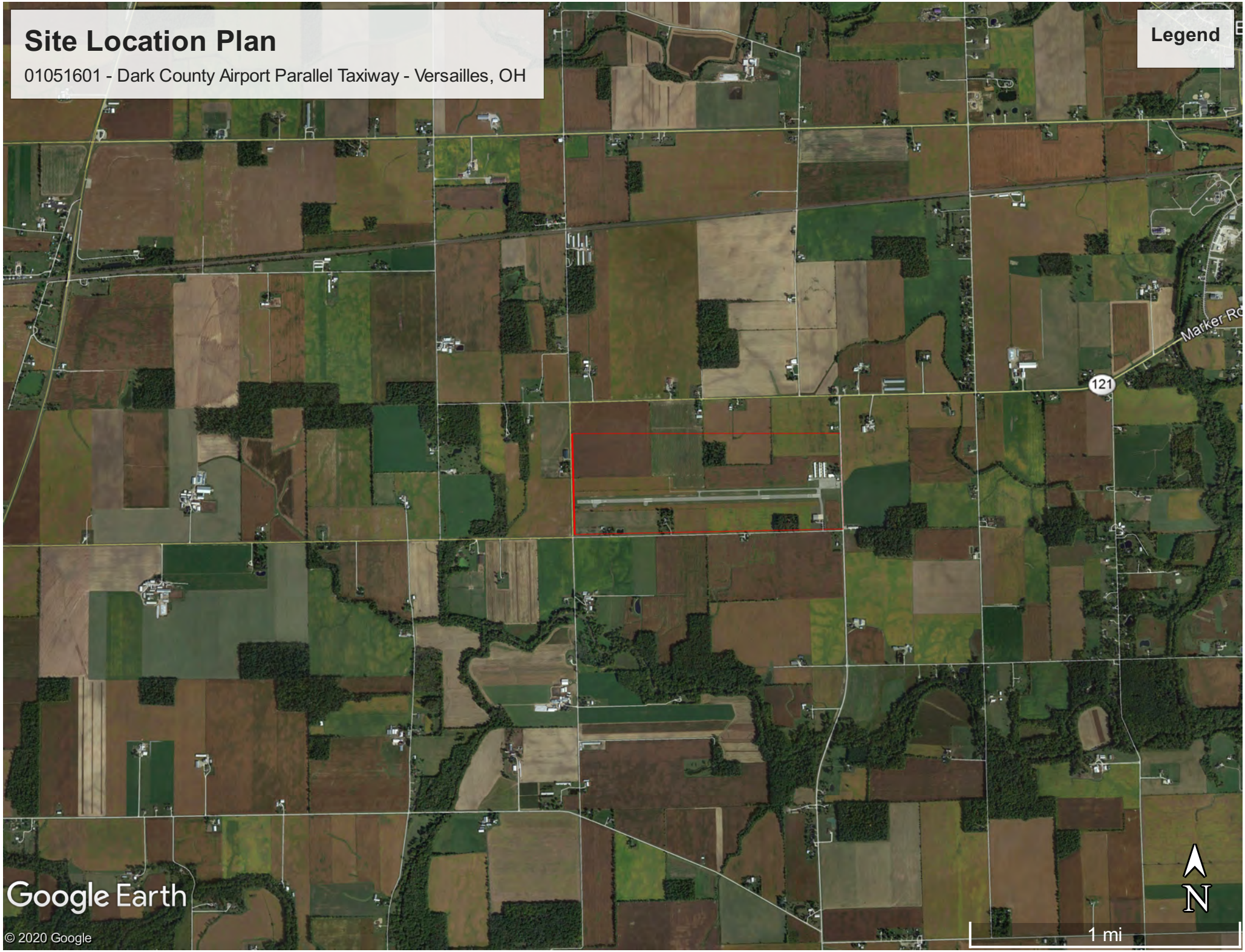
After the plans and specifications are more complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Crawford, Murphy & Tilly, Inc for the specific application to the proposed Parallel Taxiway to Runway 9/27 and West Apron Terminal project at the Darke County Airport located at 9724 OH-121 in Versailles, Darke County, Ohio.

# APPENDIX

Site Location Plan
Boring Location Plan
Boring Logs
Laboratory Test Results
USGS Seismic Map
Key to Symbols
General Notes

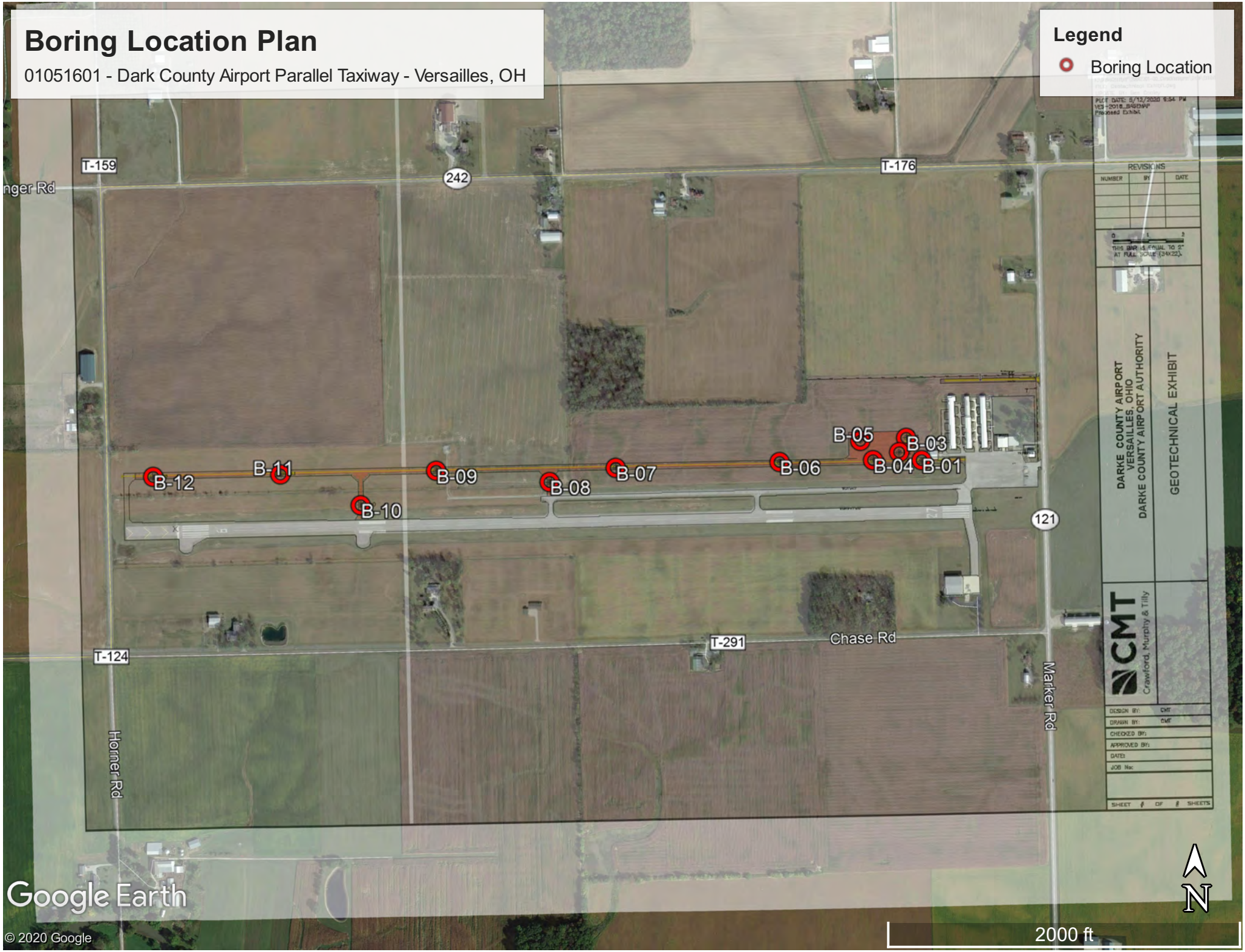
# Site Location Plan

01051601 - Dark County Airport Parallel Taxiway - Versailles, OH



# Boring Location Plan

01051601 - Dark County Airport Parallel Taxiway - Versailles, OH



# BORING B-01

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1004 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2054° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5249° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0) | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 14 | Stiff, Moist, Dark Brown, **LEAN TO FAT CLAY WITH SAND**, Trace Organics | CL/CH | 3-3-4 $N_{60}$=10 | 24 | | |
| 1000 | | | | 2 | 14 | Very Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** | | 4-4-7 $N_{60}$=16 | 18 | | |
| | 5 | | | 3 | 14 | | CL | 4-5-7 $N_{60}$=17 | 13 | | |
| 995 | | | | 4 | 14 | | | 7-11-20 $N_{60}$=45 | 16 | | |
| | 10 | | | | | End of Boring, 10' Cave Depth, 6' (Dry) | | | | | |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Telephone: (937) 898-1200


**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-02

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2055° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5253° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | Additional Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | 12" **TOPSOIL** | TOPSOIL | | | |
| | | 1 | 14 | Medium Stiff, Moist, Dark Brown, **FAT CLAY WITH SAND** | CH | 2-2-3<br>$N_{60}$=7 | 26 | LL = 56<br>PL = 22<br>Fines=84.5% |
| | | 2 | 14 | Stiff, Moist, Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 3-3-4<br>$N_{60}$=10 | 26 | |
| 1000 | 5 | 3 | 12 | Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** Grading to **LEAN CLAY WITH GRAVEL** | CL | 3-4-4<br>$N_{60}$=12 | 16 | |
| | | 4 | 14 | | | 10-13-17<br>$N_{60}$=43 | 14 | |
| 995 | 10 | | | End of Boring, 10'<br>Cave Depth, 7' (Dry) | | | | |

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
Moisture, PL, LL: 0 — 25 — 50
STRENGTH, tsf
Qu, Qp: 0 — 2.0 — 4.0


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Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-03

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2057° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5252° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0) | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 6 | Medium Stiff, Moist, Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 2-2-3 $N_{60}$=7 | 23 | | |
| | | | | 2 | 14 | Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** | | 5-7-5 $N_{60}$=17 | 14 | | |
| 1000 | 5 | | | | | | CL | | | | |
| | | | | 3 | 14 | | | 5-7-10 $N_{60}$=25 | 17 | | |
| | | | | 4 | 14 | | | 10-178-19 $N_{60}$=52 | 12 | | |
| 995 | 10 | | | | | End of Boring, 10'<br>Cave Depth, 7.5' (Dry) | | | | | |


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**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-04

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2054° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5259° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0) | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 12 | Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND**, Trace Organics in SS-2 | | 2-3-5 $N_{60}$=12 | 16 | | |
| | | | | 2 | 14 | | | 5-7-10 $N_{60}$=25 | 15 | | |
| 1000 | 5 | | | | | | CL | | | | |
| | | | | 3 | 14 | | | 6-8-11 $N_{60}$=27 | 16 | | |
| | | | | 4 | 14 | | | 7-11-15 $N_{60}$=38 | 15 | | |
| 995 | 10 | | | | | End of Boring, 10' Cave Depth, 7' (Dry) | | | | | |


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Versailles, Ohio 45380

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# BORING B-05

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2057° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5261° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 12 | Stiff, Moist, Dark Brown/Gray, **FAT CLAY WITH SAND** | CH | 2-3-3<br>$N_{60}$=9 | 26 | | |
| | | | | 2 | 14 | Very Stiff to Hard, Moist to Damp, Brown, **LEAN CLAY WITH SAND** | | 4-5-5<br>$N_{60}$=14 | 17 | | LL = 35<br>PL = 18<br>Fines=77.9% |
| 1000 | 5 | | | 3 | 14 | | CL | 6-7-10<br>$N_{60}$=25 | 11 | | |
| | | | | 4 | 14 | | | 9-15-23<br>$N_{60}$=55 | 17 | | |
| 995 | 10 | | | | | End of Boring, 10'<br>Cave Depth, 7' (Dry) | | | | | |


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Versailles, Ohio 45380

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# BORING B-06

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2054° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5278° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0) | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 14 | Medium Stiff to Stiff, Moist, Brown to Dark Brown, **FAT CLAY** | CH | 2-2-2 $N_{60}$=6 | 29 | | |
| | | | | 2 | 14 | | | 2-3-3 $N_{60}$=9 | 30 | | |
| 1000 | 5 | | | | | Very Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** | CL | | | | |
| | | | | 3 | 14 | | | 5-6-8 $N_{60}$=20 | 16 | >>✳ | |
| | | | | 4 | 12 | | | 8-11-13 $N_{60}$=35 | 15 | >>✳ | |
| 995 | 10 | | | | | End of Boring, 10' Cave Depth, 7' (Dry) | | | | | |


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**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-07

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1008 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2053° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5311° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 12 | Medium Stiff, Moist, Brown and Dark Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 2-2-3 $N_{60}$=7 | 24 | | |
| 1005 | | | | | | Very Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** | | | | | |
| | | | | 2 | 14 | | | 5-7-11 $N_{60}$=26 | 14 | | |
| | 5 | | | | | | | | | | |
| | | | | 3 | 14 | | CL | 5-6-10 $N_{60}$=23 | 13 | | |
| 1000 | | | | | | | | | | | |
| | | | | 4 | 14 | | | 8-12-19 $N_{60}$=45 | 15 | | |
| | 10 | | | | | End of Boring, 10' Cave Depth, 7.5' (Dry) | | | | | |

Moisture ×  PL ◪  LL ✚ — 0 / 25 / 50

Qu ▲  Qp ✳ — 0 / 2.0 / 4.0


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**LOCATION:** 9724 OH-121
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The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-08

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1007 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.205° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5324° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ / STRENGTH, tsf | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| 1005 | | | | 1 | 12 | Medium Stiff, Moist, Brown, **LEAN CLAY WITH SAND**, Trace Roots | CL | 3-2-3 $N_{60}$=7 | 21 | | |
| | 5 | | | 2 | 14 | Hard, Moist, Brown to Gray, **LEAN CLAY WITH SAND** | | 3-10-13 $N_{60}$=33 | 16 | | |
| 1000 | | | | 3 | 14 | | CL | 7-8-11 $N_{60}$=27 | 16 | | LL = 26 PL = 15 Fines=77.0% |
| | 10 | | | 4 | 14 | | | 10-14-16 $N_{60}$=43 | 16 | | |
| | | | | | | End of Boring, 10' Cave Depth, 6' (Dry) | | | | | |


Professional Service Industries, Inc.
5599 Webster Street
Dayton, OH 45414
Telephone: (937) 898-1200


**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-09

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1009 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2052° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5347° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Graphic Log | Sample Type | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0) | Additional Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | 12" **TOPSOIL** | TOPSOIL | | | | |
| | | | | 1 | 12 | Stiff, Moist, Dark Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 2-3-3 $N_{60}$=9 | 24 | | |
| 1005 | | | | 2 | 14 | Stiff to Very Stiff, Moist, Brown, **LEAN CLAY WITH SAND** | CL | 2-3-6 $N_{60}$=13 | 16 | >>✳ | |
| | 5 | | | 3 | 14 | | | 5-6-7 $N_{60}$=19 | 16 | >>✳ | |
| 1000 | | | | 4 | 14 | Very Hard, Moist, Brown, **SANDY LEAN CLAY** | CL | 11-14-21 $N_{60}$=51 | 15 | >>✳ | |
| | 10 | | | | | End of Boring, 10'<br>Cave Depth, 7' (Dry) | | | | | |


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**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-10

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2049° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5363° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | Additional Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | 12" **TOPSOIL** | TOPSOIL | | | |
| | | 1 | 12 | Stiff, Moist, Brown, **LEAN CLAY WITH SAND** | CL | 3-3-5<br>$N_{60}$=12 | 15 | LL = 31<br>PL = 18<br>Fines=74.7% |
| | | 2 | 14 | Hard, Moist, Brown, **SANDY LEAN CLAY** | CL | 8-10-11<br>$N_{60}$=30 | 14 | |
| 1000 | 5 | | | | | | | |
| | | 3 | 14 | Hard, Moist, Brown, **LEAN CLAY WITH SAND** | CL | 7-10-11<br>$N_{60}$=30 | 15 | |
| | | 4 | 14 | | | 9-11-14<br>$N_{60}$=36 | 16 | |
| 995 | 10 | | | End of Boring, 10'<br>Cave Depth, 6' (Dry) | | | | |

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
Moisture, PL, LL
0 25 50
STRENGTH, tsf
Qu, Qp
0 2.0 4.0


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**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-11

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2052° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5379° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | Additional Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | 12" **TOPSOIL** | TOPSOIL | | | |
| | | 1 | 12 | Medium Stiff, Moist, Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 2-2-2<br>$N_{60}$=6 | 24 | |
| | | 2 | 14 | Very Stiff to Hard, Moist, Brown, **LEAN CLAY WITH SAND** | | 6-5-6<br>$N_{60}$=16 | 15 | |
| 1000 | 5 | 3 | 14 | | CL | 6-8-10<br>$N_{60}$=26 | 16 | |
| | | 4 | 14 | | | 7-11-16<br>$N_{60}$=39 | 15 | |
| 995 | 10 | | | End of Boring, 10'<br>Cave Depth, 6' (Dry) | | | | |

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0


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**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.

# BORING B-12

| | | | |
|---|---|---|---|
| **DATE STARTED:** | 6/1/20 | **DRILL COMPANY:** | Central Star |
| **DATE COMPLETED:** | 6/1/20 | **DRILLER:** TS | **LOGGED BY:** GR |
| **COMPLETION DEPTH** | 10.0 ft | **DRILL RIG:** | Diedrich D50 |
| **BENCHMARK:** | N/A | **DRILLING METHOD:** | Hollow Stem Auger |
| **ELEVATION:** | 1005 ft | **SAMPLING METHOD:** | 2-in SS/SPT |
| **LATITUDE:** | 40.2051° | **HAMMER TYPE:** | Automatic |
| **LONGITUDE:** | -84.5405° | **EFFICIENCY** | 87% |
| **STATION:** N/A | **OFFSET:** N/A | **REVIEWED BY:** | RAS |

**Water**

| | |
|---|---|
| While Drilling | N/A feet |
| Upon Completion | N/A feet |
| Delay | N/A |

**BORING LOCATION:**
See Boring Location Plan

**REMARKS:** $N_{60}$ denotes the normalization to 60% efficiency as described in ASTM D4633.

| Elevation (feet) | Depth, (feet) | Sample No. | Recovery (inches) | MATERIAL DESCRIPTION | USCS Classification | SPT Blows per 6-inch (SS) | Moisture, % | Additional Remarks |
|---|---|---|---|---|---|---|---|---|
| | 0 | | | 12" **TOPSOIL** | TOPSOIL | | | |
| | | 1 | 6 | Stiff, Moist, Brown, **LEAN TO FAT CLAY WITH SAND** | CL/CH | 2-3-4<br>$N_{60}$=10 | 24 | |
| | | 2 | 6 | Hard, Moist, Brown and Gray, **LEAN CLAY WITH SAND** | | 7-9-12<br>$N_{60}$=30 | 15 | LL = 34<br>PL = 17<br>Fines=75.3% |
| 1000 | 5 | | | | | | | |
| | | 3 | 6 | | CL | 5-7-10<br>$N_{60}$=25 | 17 | |
| | | 4 | 6 | | | 8-10-15<br>$N_{60}$=36 | 17 | |
| 995 | 10 | | | End of Boring, 10'<br>Cave Depth, 6' | | | | |

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0


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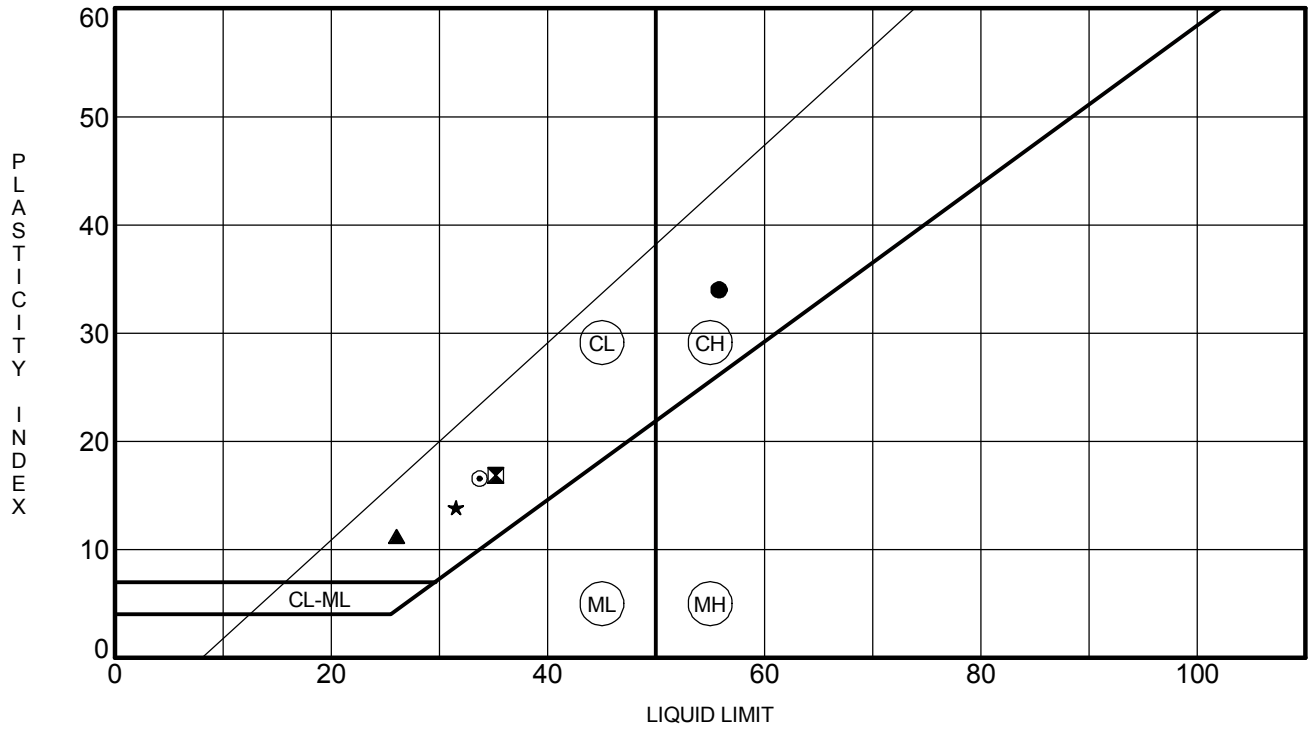
**PROJECT NO.:** 01051601
**PROJECT:** Parallel Taxiway and West Apron Terminal
**LOCATION:** 9724 OH-121
Versailles, Ohio 45380

The stratification lines represent approximate boundaries. The transition may be gradual.




| | Boring | Depth (ft) | LL | PL | PI | Fines | Classification (*Visual) |
|---|---|---|---|---|---|---|---|
| ● | **B-02** | **1.8** | **56** | **22** | **34** | **84.5** | **FAT CLAY WITH SAND (CH)** |
| ⊠ | **B-05** | **4.3** | **35** | **18** | **17** | **77.9** | **LEAN CLAY WITH SAND (CL)** |
| ▲ | **B-08** | **6.8** | **26** | **15** | **11** | **77.0** | **LEAN CLAY WITH SAND (CL)** |
| ★ | **B-10** | **1.8** | **31** | **18** | **13** | **74.7** | **LEAN CLAY WITH SAND (CL)** |
| ⊙ | **B-12** | **4.3** | **34** | **17** | **17** | **75.3** | **LEAN CLAY WITH SAND (CL)** |

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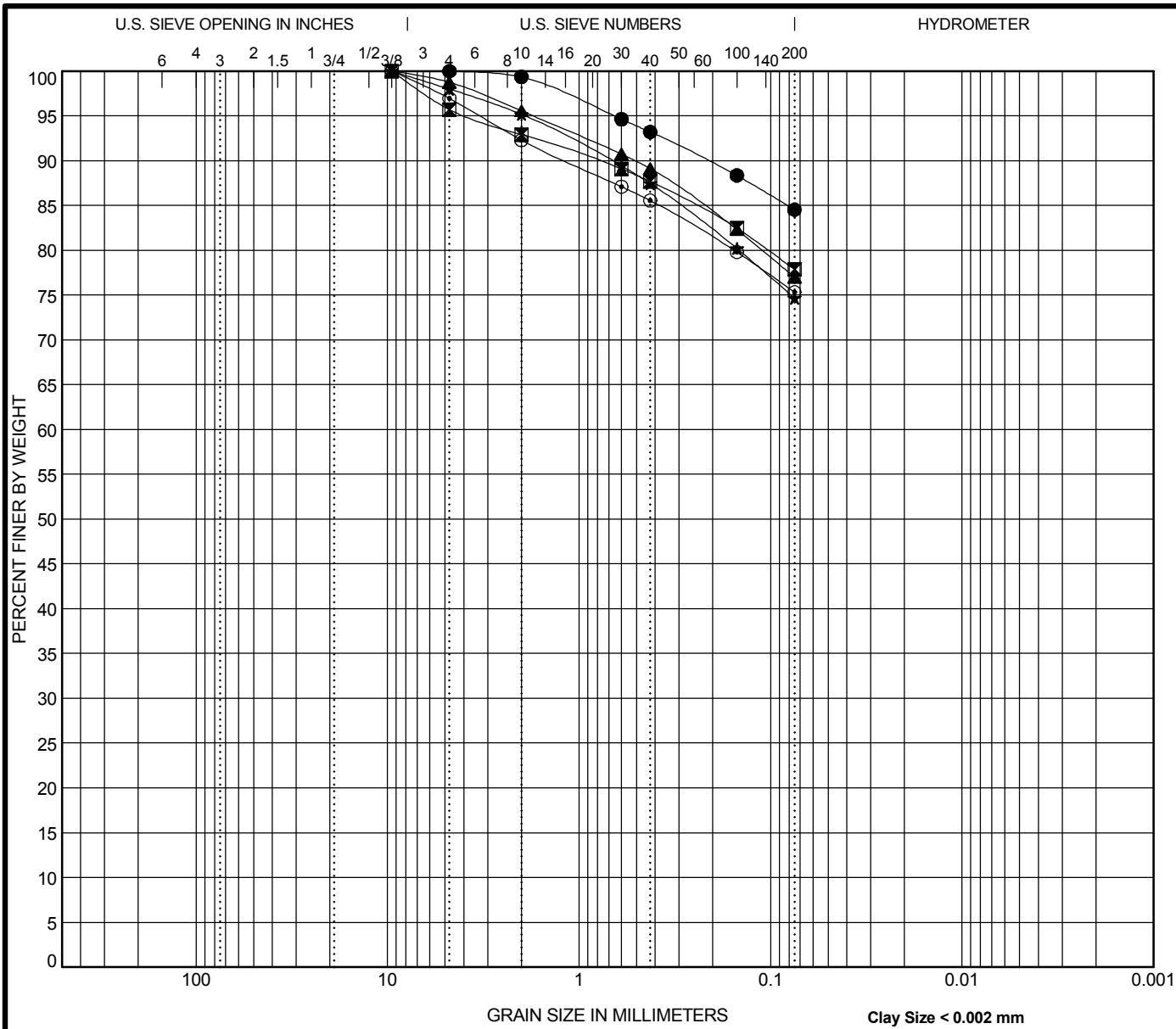
## ATTERBERG LIMIT RESULTS

PSI Job No.: 01051601
Project: Parallel Taxiway and West Apron Terminal
Location: 9724 OH-121
Versailles, Ohio 45380




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Specimen Identification | | Classification | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | B-02 | 1.8 | FAT CLAY WITH SAND (CH) | 56 | 22 | 34 | | |
| ⊠ | B-05 | 4.3 | LEAN CLAY WITH SAND (CL) | 35 | 18 | 17 | | |
| ▲ | B-08 | 6.8 | LEAN CLAY WITH SAND (CL) | 26 | 15 | 11 | | |
| ★ | B-10 | 1.8 | LEAN CLAY WITH SAND (CL) | 31 | 18 | 13 | | |
| ⊙ | B-12 | 4.3 | LEAN CLAY WITH SAND (CL) | 34 | 17 | 17 | | |

| | Specimen Identification | | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | B-02 | 1.8 | 4.75 | | | | 0.0 | 15.5 | 84.5 | |
| ⊠ | B-05 | 4.3 | 9.5 | | | | 4.2 | 17.9 | 77.9 | |
| ▲ | B-08 | 6.8 | 9.5 | | | | 1.2 | 21.8 | 77.0 | |
| ★ | B-10 | 1.8 | 9.5 | | | | 2.0 | 23.3 | 74.7 | |
| ⊙ | B-12 | 4.3 | 9.5 | | | | 3.0 | 21.6 | 75.4 | |

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# GRAIN SIZE DISTRIBUTION

Project: Parallel Taxiway and West Apron Terminal
PSI Job No.: 01051601
Location: 9724 OH-121
Versailles, Ohio 45380

Professional Service Industries, Inc.
5599 Webster Avenue
Dayton, OH 45414

Phone: (937) 898-1200
Fax: (937) 898-1230

**Report No: PTR:01051601-1-S1**
**Issue No: 1**



# Proctor Report

**Client:** CRAWFORD MURPHY & TILLY **CC:** BEN COOLEY
8101 NORTH HIGH STREET, SUITE 150
COLUMBUS, OH 42325

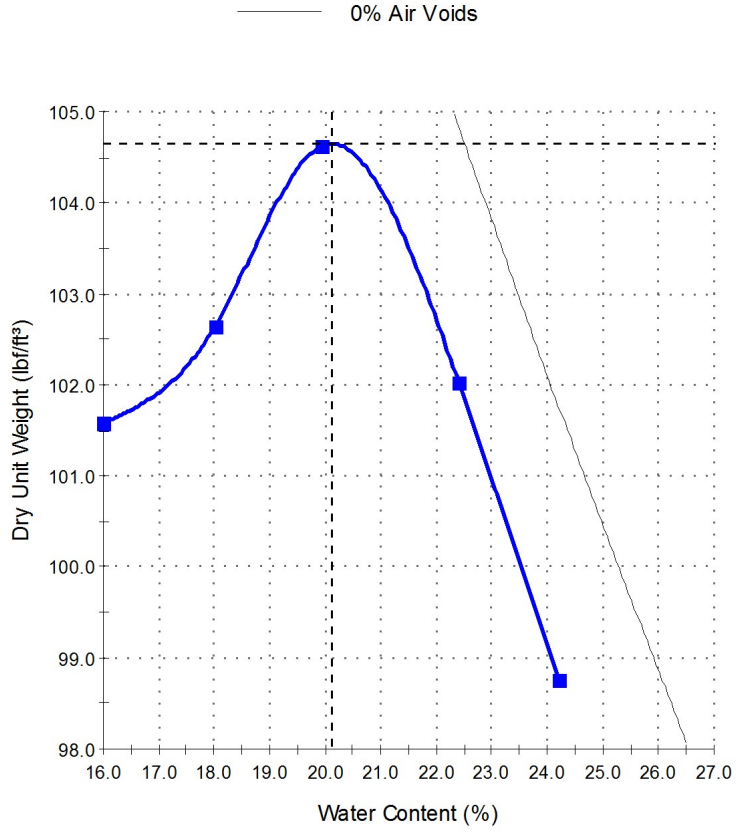
**Project:** PARALLEL TAXIWAY/APRON TERM.
VERSAILLES, OH

Approved Signatory: R. Andrew Schlarman II (Department Manager)
Date of Issue: 6/10/2020

## Sample Details

| | | | |
|---|---|---|---|
| **Sample ID:** | 01051601-1-S1 | **Date Sampled:** | 6/1/2020 |
| **Date Received:** | 6/1/2020 | **Sampled By:** | PSI |
| **Specification:** | #200 Wash and Sieve | **Source:** | Grab Sample |
| **Material:** | Brown, Lean Clay with Sand (CL) | **Sampling Method:** | Hand Auger |
| **General Location:** | Composite Bulk Sample - In-Place Material | **Location:** | Soil Borings B-1 through B-12, Depth: 1' to 3' Below Existing Grades |
| **Tested By:** | Glen Curtis | **Date Tested:** | 6/5/2020 |

## Dry Unit Weight - Water Content Relationship




## Test Results

ASTM D 698

| | |
|---|---|
| **Maximum Dry Unit Weight (lbf/ft³):** | **104.6** |
| **Optimum Water Content (%):** | **20.1** |
| Method: | A |
| Preparation Method: | Dry |
| Rammer Type: | Automatic |
| Specific Gravity (Fines): | 2.70 |
| Specific Gravity Method: | estimated |
| Retained Sieve No 4 (4.75mm) (%): | 1 |
| Passing Sieve No 4 (4.75mm) (%): | 99 |
| Tested By: | Glen Curtis |
| Date Tested: | 6/5/2020 |

ASTM D 4318

| | |
|---|---|
| Liquid Limit (%): | 48 |
| Plastic Limit (%): | 19 |
| Plasticity Index (%): | 29 |
| Tested By: | Glen Curtis |
| Date Tested: | 6/8/2020 |

## Comments

Professional Service Industries, Inc.
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Dayton, OH 45414

Phone: (937) 898-1200
Fax: (937) 898-1230

**Report No: MAT:01051601-1-S1**
**Issue No: 1**



# Material Test Report

**Client:** CRAWFORD MURPHY & TILLY **CC:** BEN COOLEY
8101 NORTH HIGH STREET, SUITE 150
COLUMBUS, OH 42325

**Project:** PARALLEL TAXIWAY/APRON TERM.
VERSAILLES, OH

Approved Signatory: R. Andrew Schlarman II (Department Manager)
Date of Issue: 6/10/2020

## Sample Details

| | | | |
|---|---|---|---|
| **Sample ID:** | 01051601-1-S1 | **Lift:** | |
| **Client Sample ID:** | | **Contractor:** | |
| **Date Sampled:** | 06/01/20 | | |
| **Sampled By:** | PSI | | |
| **Specification:** | #200 Wash and Sieve | | |
| **Supplier:** | | | |
| **Source:** | Grab Sample | | |
| **Material:** | Brown, Lean Clay with Sand (CL) | | |
| **Sampling Method:** | Hand Auger | | |
| **Soil Description:** | Moist | | |
| **General Location:** | Composite Bulk Sample - In-Place Material | | |
| **Location:** | Soil Borings B-1 through B-12, Depth: 1' to 3' Below Existing Grades | | |

## Other Test Results

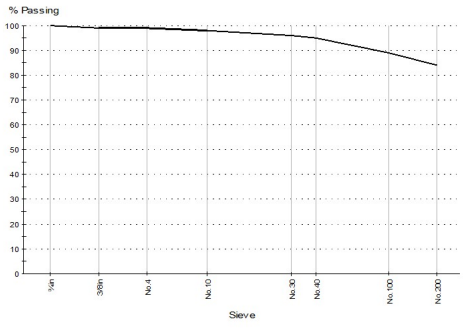
| Description | Method | Result | Limits |
|---|---|---|---|
| Curvature Coefficient | ASTM C 136, ASTM C 117 | N/A | |
| Uniformity Coefficient | | N/A | |
| Approximate maximum grain size | ASTM D 4318 | | |
| Material retained on 425µm (No. 40) (%) | | 5.0 | |
| Method of Removal | | | |
| Grooving Tool Type | | Plastic | |
| Specimen preparation method | | Dry | |
| Drying Method | | Air | |
| Special selection process | | | |
| Rolling Method for PL | | Hand | |
| As Received Water Content (%) | | | |
| Liquid Limit Device Type | | Manual | |
| Liquid Limit | | 48 | |
| Plastic Limit | | 19 | |
| Plasticity Index | | 29 | |
| Liquid Limit Procedure | | Multipoint (A) | |
| Tested By | | Glen Curtis | |
| Date Tested | | 6/8/2020 | |
| Maximum Dry Unit Weight (lbf/ft³) | ASTM D 698 | 104.6 | |
| Corrected Maximum Dry Unit Weight (lbf/ft³) | | 104.6 | |
| Optimum Water Content (%) | | 20.1 | |
| Corrected Optimum Water Content (%) | | 20.1 | |
| Method | | A | |
| Preparation Method | | Dry | |
| Rammer Type | | Automatic | |
| Retained Sieve No 4 (4.75mm) (%) | | 1 | |
| Specific Gravity (Oversize) | | 2.70 | |
| Specific Gravity (Fines) | estimated | 2.70 | |
| Tested By | ASTM D 698 | Glen Curtis | |
| Date Tested | | 6/5/2020 | |

## Particle Size Distribution

**Method:** ASTM C 136, ASTM C 117
**Drying by:** Oven
**Date Tested:** 6/8/2020
**Tested By:** Glen Curtis

| Sieve Size | % Passing | Limits |
|---|---|---|
| ¾in (19.0mm) | 100 | |
| 3/8in (9.5mm) | 99 | |
| No.4 (4.75mm) | 99 | |
| No.10 (2.0mm) | 98 | |
| No.30 (600µm) | 96 | |
| No.40 (425µm) | 95 | |
| No.100 (150µm) | 89 | |
| No.200 (75µm) | 84 | |

## Chart




## Comments

N/A

# California Bearing Ratio (CBR)

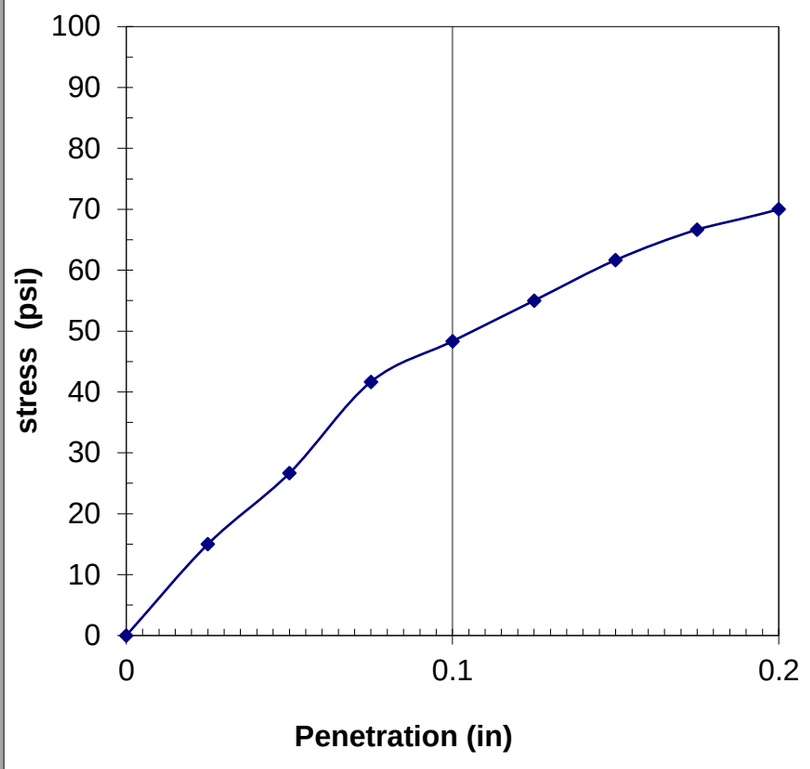
ASTM D1883-16

| | |
|---|---|
| **Project Name** | Parallel Taxiway/Apron Term. |
| **Project No.** | 1051601 |
| **Location** | Versailles, Ohio |
| **Date** | 6/16/2020 |

| | |
|---|---|
| **Boring ID** | 01051601-1-S1 |
| **Depth (ft)** | 1.0' to 3.0' |
| **Soil classification (ASTM D 2488)** | Lean Clay with Sand |
| **Preparation & Compaction** | ASTM D 698 |
| **Condition of Sample** | Soaked |
| **Surcharge amount (lbs)** | 10.0 |

| Penetration depth (in) | Dial Reading | Stress (psi) |
|---|---|---|
| 0 | 0 | 0 |
| 0.025 | 9 | 15 |
| 0.05 | 16 | 27 |
| 0.075 | 25 | 42 |
| 0.1 | 29 | 48 |
| 0.125 | 33 | 55 |
| 0.15 | 37 | 62 |
| 0.175 | 40 | 67 |
| 0.2 | 42 | 70 |
| 0.3 | 51 | 85 |
| 0.4 | 57 | 95 |
| 0.5 | 62 | 103 |

| | |
|---|---|
| **Dry Density - before soak (pcf)** | 104.6 |
| **Water content:** | |
| **As Compacted** | 20.4% |
| **Top 1 in. - After Soak** | 23.0% |
| **Swell** | 1.16% |
| **CBR at 0.1 in.** | 4.8 |
| **CBR at 0.2 in.** | 4.7 |




**Corrected Bearing Ratio (Soaked)**

**4.8**

Professional Service Industries, Inc.
5599 Webster Avenue
Dayton, OH 45414

Phone: (937) 898-1200
Fax: (937) 898-1230

**Report No: PTR:01051601-1-S2**
**Issue No: 1**



# Proctor Report

**Client:** CRAWFORD MURPHY & TILLY **CC:** BEN COOLEY
8101 NORTH HIGH STREET, SUITE 150
COLUMBUS, OH 42325

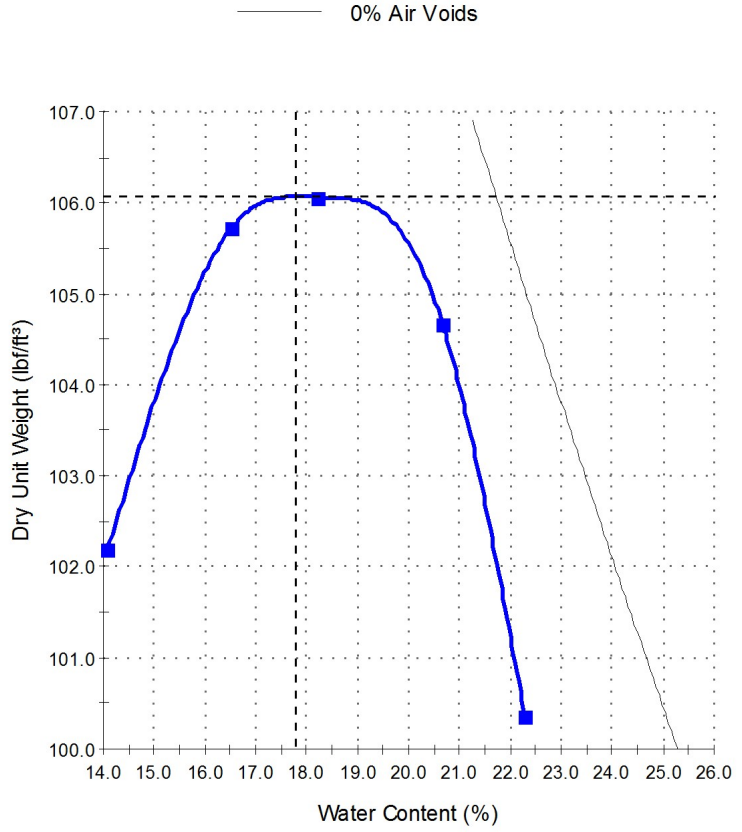
**Project:** PARALLEL TAXIWAY/APRON TERM.
VERSAILLES, OH

Approved Signatory: R. Andrew Schlarman II (Department Manager)
Date of Issue: 6/10/2020

## Sample Details

| | | | |
|---|---|---|---|
| **Sample ID:** | 01051601-1-S2 | **Date Sampled:** | 6/1/2020 |
| **Date Received:** | 6/1/2020 | **Sampled By:** | PSI |
| **Specification:** | #200 Wash and Sieve | **Source:** | Grab Sample |
| **Material:** | Brown, Lean Clay with Sand (CL) | **Sampling Method:** | Hand Auger |
| **General Location:** | Composite Bulk Sample - In-Place Material | **Location:** | Soil Borings B-1 through B-12, Depth: 3' to 5' Below Existing Grades |
| **Tested By:** | Glen Curtis | **Date Tested:** | 6/8/2020 |

## Dry Unit Weight - Water Content Relationship




## Test Results

ASTM D 698

| | |
|---|---|
| **Maximum Dry Unit Weight (lbf/ft³):** | **106.1** |
| **Optimum Water Content (%):** | **17.8** |
| Method: | A |
| Preparation Method: | Dry |
| Rammer Type: | Automatic |
| Specific Gravity (Fines): | 2.70 |
| Specific Gravity Method: | estimated |
| Retained Sieve No 4 (4.75mm) (%): | 1 |
| Passing Sieve No 4 (4.75mm) (%): | 99 |
| Tested By: | Glen Curtis |
| Date Tested: | 6/8/2020 |

ASTM D 4318

| | |
|---|---|
| Liquid Limit (%): | 40 |
| Plastic Limit (%): | 18 |
| Plasticity Index (%): | 22 |
| Tested By: | Glen Curtis |
| Date Tested: | 6/9/2020 |

## Comments

Professional Service Industries, Inc.
5599 Webster Avenue
Dayton, OH 45414

Phone: (937) 898-1200
Fax: (937) 898-1230

**Report No: MAT:01051601-1-S2**
**Issue No: 1**



# Material Test Report

**Client:** CRAWFORD MURPHY & TILLY **CC:** BEN COOLEY
8101 NORTH HIGH STREET, SUITE 150
COLUMBUS, OH 42325

**Project:** PARALLEL TAXIWAY/APRON TERM.
VERSAILLES, OH

Approved Signatory: R. Andrew Schlarman II (Department Manager)
Date of Issue: 6/10/2020

## Sample Details

| | |
|---|---|
| **Sample ID:** | 01051601-1-S2 **Lift:** |
| **Client Sample ID:** | **Contractor:** |
| **Date Sampled:** | 06/01/20 |
| **Sampled By:** | PSI |
| **Specification:** | #200 Wash and Sieve |
| **Supplier:** | |
| **Source:** | Grab Sample |
| **Material:** | Brown, Lean Clay with Sand (CL) |
| **Sampling Method:** | Hand Auger |
| **Soil Description:** | Moist |
| **General Location:** | Composite Bulk Sample - In-Place Material |
| **Location:** | Soil Borings B-1 through B-12, Depth: 3' to 5' Below Existing Grades |

## Other Test Results

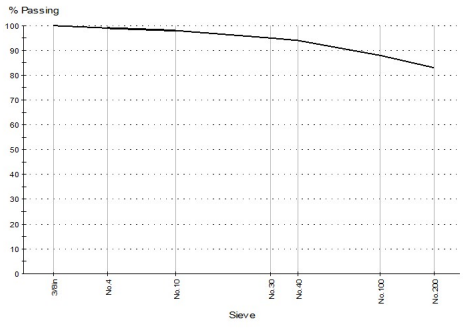
| Description | Method | Result | Limits |
|---|---|---|---|
| Curvature Coefficient | ASTM C 136, ASTM C 117 | N/A | |
| Uniformity Coefficient | | N/A | |
| Approximate maximum grain size | ASTM D 4318 | | |
| Material retained on 425µm (No. 40) (%) | | 6.0 | |
| Method of Removal | | | |
| Grooving Tool Type | | Plastic | |
| Specimen preparation method | | Dry | |
| Drying Method | | Air | |
| Special selection process | | | |
| Rolling Method for PL | | Hand | |
| As Received Water Content (%) | | | |
| Liquid Limit Device Type | | Manual | |
| Liquid Limit | | 40 | |
| Plastic Limit | | 18 | |
| Plasticity Index | | 22 | |
| Liquid Limit Procedure | | Multipoint (A) | |
| Tested By | | Glen Curtis | |
| Date Tested | | 6/9/2020 | |
| Maximum Dry Unit Weight (lbf/ft³) | ASTM D 698 | 106.1 | |
| Corrected Maximum Dry Unit Weight (lbf/ft³) | | 106.1 | |
| Optimum Water Content (%) | | 17.8 | |
| Corrected Optimum Water Content (%) | | 17.8 | |
| Method | | A | |
| Preparation Method | | Dry | |
| Rammer Type | | Automatic | |
| Retained Sieve No 4 (4.75mm) (%) | | 1 | |
| Specific Gravity (Oversize) | | 2.70 | |
| Specific Gravity (Fines) | estimated | 2.70 | |
| Tested By | ASTM D 698 | Glen Curtis | |
| Date Tested | | 6/8/2020 | |

## Particle Size Distribution

**Method:** ASTM C 136, ASTM C 117
**Drying by:** Oven
**Date Tested:** 6/9/2020
**Tested By:**

| Sieve Size | % Passing | Limits |
|---|---|---|
| 3/8in (9.5mm) | 100 | |
| No.4 (4.75mm) | 99 | |
| No.10 (2.0mm) | 98 | |
| No.30 (600µm) | 95 | |
| No.40 (425µm) | 94 | |
| No.100 (150µm) | 88 | |
| No.200 (75µm) | 83 | |

## Chart




## Comments

N/A

# California Bearing Ratio (CBR)

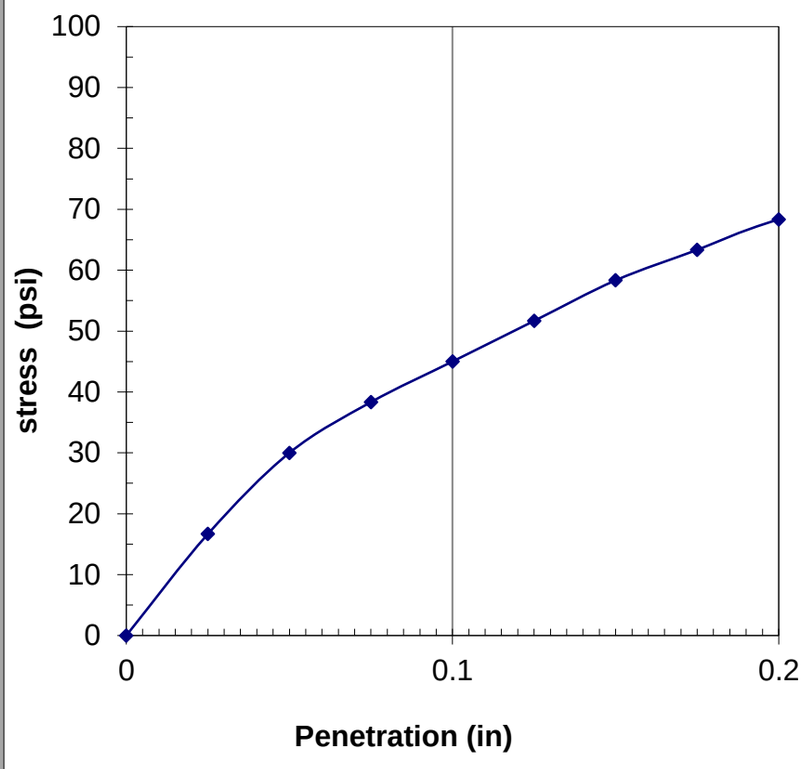
ASTM D1883-16

| | |
|---|---|
| **Project Name** | Parallel Taxiway/Apron Term. |
| **Project No.** | 1051601 |
| **Location** | Versailles, Ohio |
| **Date** | 6/16/2020 |

| | |
|---|---|
| **Boring ID** | 01051601-1-S2 |
| **Depth (ft)** | 3.0' to 5.0' |
| **Soil classification (ASTM D 2488)** | Lean Clay with Sand |
| **Preparation & Compaction** | ASTM D 698 |
| **Condition of Sample** | Soaked |
| **Surcharge amount (lbs)** | 10.0 |

| Penetration depth (in) | Dial Reading | Stress (psi) |
|---|---|---|
| 0 | 0 | 0 |
| 0.025 | 10 | 17 |
| 0.05 | 18 | 30 |
| 0.075 | 23 | 38 |
| 0.1 | 27 | 45 |
| 0.125 | 31 | 52 |
| 0.15 | 35 | 58 |
| 0.175 | 38 | 63 |
| 0.2 | 41 | 68 |
| 0.3 | 50 | 83 |
| 0.4 | 57 | 95 |
| 0.5 | 63 | 105 |

| | |
|---|---|
| **Dry Density - before soak (pcf)** | 107.1 |
| **Water content:** | |
| **As Compacted** | 18.3% |
| **Top 1 in. - After Soak** | 20.5% |
| **Swell** | 1.05% |
| **CBR at 0.1 in.** | 4.5 |
| **CBR at 0.2 in.** | 4.5 |




**Corrected Bearing Ratio (Soaked)**

**4.5**

# GENERAL NOTES

## SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

## DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

## SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
$N_{60}$: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
$Q_u$: Unconfined compressive strength, TSF
$Q_p$: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,▼ Apparent groundwater level at time noted

## RELATIVE DENSITY OF COARSE-GRAINED SOILS

| Relative Density | N - Blows/foot |
|---|---|
| Very Loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium Dense | 10 - 30 |
| Dense | 30 - 50 |
| Very Dense | 50 - 80 |
| Extremely Dense | 80+ |

## ANGULARITY OF COARSE-GRAINED PARTICLES

| Description | Criteria |
|---|---|
| Angular: | Particles have sharp edges and relatively plane sides with unpolished surfaces |
| Subangular: | Particles are similar to angular description, but have rounded edges |
| Subrounded: | Particles have nearly plane sides, but have well-rounded corners and edges |
| Rounded: | Particles have smoothly curved sides and no edges |

## GRAIN-SIZE TERMINOLOGY

| Component | Size Range |
|---|---|
| Boulders: | Over 300 mm (>12 in.) |
| Cobbles: | 75 mm to 300 mm (3 in. to 12 in.) |
| Coarse-Grained Gravel: | 19 mm to 75 mm (¾ in. to 3 in.) |
| Fine-Grained Gravel: | 4.75 mm to 19 mm (No.4 to ¾ in.) |
| Coarse-Grained Sand: | 2 mm to 4.75 mm (No.10 to No.4) |
| Medium-Grained Sand: | 0.42 mm to 2 mm (No.40 to No.10) |
| Fine-Grained Sand: | 0.075 mm to 0.42 mm (No. 200 to No.40) |
| Silt: | 0.002 mm to 0.075 mm |
| Clay: | <0.002mm to <0.005 mm depending on agency |

## PARTICLE SHAPE

| Description | Criteria |
|---|---|
| Flat: | Particles with width/thickness ratio > 3 |
| Elongated: | Particles with length/width ratio > 3 |
| Flat & Elongated: | Particles meet criteria for both flat and elongated |

## RELATIVE PROPORTIONS OF FINES

| Descriptive Term | % Dry Weight |
|---|---|
| Trace: | < 5% |
| With: | 5% to 12% |
| Modifier: | >12% |

# GENERAL NOTES

(Continued)

## CONSISTENCY OF FINE-GRAINED SOILS

| $Q_U$ - TSF | N - Blows/foot | Consistency |
|---|---|---|
| 0 - 0.25 | 0 - 2 | Very Soft |
| 0.25 - 0.50 | 2 - 4 | Soft |
| 0.50 - 1.00 | 4 - 8 | Firm (Medium Stiff) |
| 1.00 - 2.00 | 8 - 15 | Stiff |
| 2.00 - 4.00 | 15 - 30 | Very Stiff |
| 4.00 - 8.00 | 30 - 50 | Hard |
| 8.00+ | 50+ | Very Hard |

## MOISTURE CONDITION DESCRIPTION

| Description | Criteria |
|---|---|
| Dry: | Absence of moisture, dusty, dry to the touch |
| Moist: | Damp but no visible water |
| Wet: | Visible free water, usually soil is below water table |

## RELATIVE PROPORTIONS OF SAND AND GRAVEL

| Descriptive Term | % Dry Weight |
|---|---|
| Trace: | < 15% |
| With: | 15% to 30% |
| Modifier: | >30% |

## STRUCTURE DESCRIPTION

| Description | Criteria |
|---|---|
| Stratified: | Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick |
| Laminated: | Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick |
| Fissured: | Breaks along definite planes of fracture with little resistance to fracturing |
| Slickensided: | Fracture planes appear polished or glossy, sometimes striated |
| Blocky: | Cohesive soil that can be broken down into small angular lumps which resist further breakdown |
| Lensed: | Inclusion of small pockets of different soils |
| Layer: | Inclusion greater than 3 inches thick (75 mm) |
| Seam: | Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample |
| Parting: | Inclusion less than 1/8-inch (3 mm) thick |

## SCALE OF RELATIVE ROCK HARDNESS

| $Q_U$ - TSF | Consistency |
|---|---|
| 2.5 - 10 | Extremely Soft |
| 10 - 50 | Very Soft |
| 50 - 250 | Soft |
| 250 - 525 | Medium Hard |
| 525 - 1,050 | Moderately Hard |
| 1,050 - 2,600 | Hard |
| >2,600 | Very Hard |

## ROCK BEDDING THICKNESSES

| Description | Criteria |
|---|---|
| Very Thick Bedded | Greater than 3-foot (>1.0 m) |
| Thick Bedded | 1-foot to 3-foot (0.3 m to 1.0 m) |
| Medium Bedded | 4-inch to 1-foot (0.1 m to 0.3 m) |
| Thin Bedded | 1¼-inch to 4-inch (30 mm to 100 mm) |
| Very Thin Bedded | ½-inch to 1¼-inch (10 mm to 30 mm) |
| Thickly Laminated | 1/8-inch to ½-inch (3 mm to 10 mm) |
| Thinly Laminated | 1/8-inch or less "paper thin" (<3 mm) |

## ROCK VOIDS

| Voids | Void Diameter |
|---|---|
| Pit | <6 mm (<0.25 in) |
| Vug | 6 mm to 50 mm (0.25 in to 2 in) |
| Cavity | 50 mm to 600 mm (2 in to 24 in) |
| Cave | >600 mm (>24 in) |

## GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

| Component | Size Range |
|---|---|
| Very Coarse Grained | >4.76 mm |
| Coarse Grained | 2.0 mm - 4.76 mm |
| Medium Grained | 0.42 mm - 2.0 mm |
| Fine Grained | 0.075 mm - 0.42 mm |
| Very Fine Grained | <0.075 mm |

## ROCK QUALITY DESCRIPTION

| Rock Mass Description | RQD Value |
|---|---|
| Excellent | 90 -100 |
| Good | 75 - 90 |
| Fair | 50 - 75 |
| Poor | 25 -50 |
| Very Poor | Less than 25 |

## DEGREE OF WEATHERING

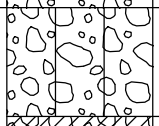
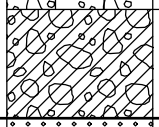
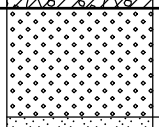
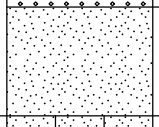
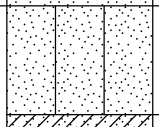
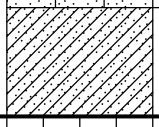
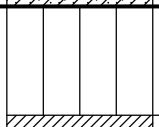
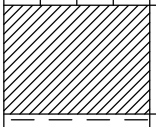
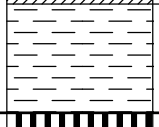
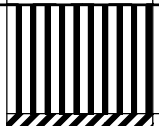
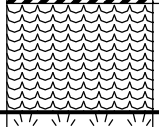
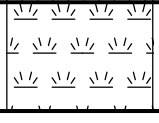
Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

# SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

| MAJOR DIVISIONS | | | SYMBOLS | | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| | | | GRAPH | LETTER | |
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS |  | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | (LITTLE OR NO FINES) |  | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES |  | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | (APPRECIABLE AMOUNT OF FINES) |  | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | SAND AND SANDY SOILS | CLEAN SANDS |  | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | (LITTLE OR NO FINES) |  | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES |  | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | (APPRECIABLE AMOUNT OF FINES) |  | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 |  | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | |  | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | |  | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 |  | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | |  | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | |  | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | |  | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

| DARKE COUNTY AIRPORT | | | | | |
|---|---|---|---|---|---|
| ITEMIZED PROPOSAL - ADDENDUM #1 | | | | | |
| CONSTRUCT/EXPAND HANGAR | | | | | |
| | | | | | |
| **ITEM NO.** | **DESCRIPTION** | **UNIT** | **QUANTITY** | **UNIT PRICE** | **AMOUNT** |
| **General Site Work:** | | | | | |
| S1 | Mobilization | L.S. | 1 | | |
| S2 | Production Staking By Contractor | L.S. | 1 | | |
| S3 | Unclassified Excavation | L.S. | 1 | | |
| S4 | Hydro Seeding | L.S. | 1 | | |
| | | | | **General Site Work TOTAL** | |
| **Hangar 100' by 80'** | | | | | |
| B1 | Pre-Engineered Building (Includes the building delivered to the site) | L.S. | 1 | | |
| B2 | General Construction Work (Includes floor slab, foundations, building erection, and excavation for the building. It does not include any site work beyond the building walls) | L.S. | 1 | | |
| B3 | Electrical (Includes Service Connection, main panel, overhead lighting, outlets, door operators) | L.S. | 1 | | |
| B4 | 90 Foot by 26 Foot Clear Opening One Piece Hydraulic | L.S. | 1 | | |
| B5 | Approach Apron 7 Inch, Concrete Pavement | S.Y. | 561 | | |
| B6 | ODOT 304 Aggregate Base | C.Y. | 94 | | |
| B7 | Floor Trench Drain | L.F. | 45 | | |
| B8 | Propane Radiant Floor Heating and Equipment | L.S. | 1 | | |
| B9 | Hangar Overhead Fan | L.S. | 1 | | |
| B10 | Water Service & Spigot | L.S. | 1 | | |
| | | | | **HANGAR 100' by 80':** | |
| **HANGAR 100' by 80' Alternate Bid Items** | | | | | |
| A1 | Hangar Floor Epoxy Seal Coating - 100'x80' Hangar (Non-AIP) | L.S. | 1 | | |
| | | | | | |
| **Hangar 100' by 100'** | | | | | |
| B1 | Pre-Engineered Building (Includes the building delivered to the site) | L.S. | 1 | | |
| B2 | General Construction Work (Includes floor slab, foundations, building erection, and excavation for the building. It does not include any site work beyond the building walls) | L.S. | 1 | | |
| B3 | Electrical (Includes Service Connection, main panel, overhead lighting, outlets, door operators) | L.S. | 1 | | |
| B4 | 90 Foot by 26 Foot Clear Opening One Piece Hydraulic | L.S. | 1 | | |
| B5 | Approach Apron 7 Inch, Concrete Pavement | S.Y. | 561 | | |
| B6 | ODOT 304 Aggregate Base | C.Y. | 94 | | |
| B7 | Floor Trench Drain | L.F. | 45 | | |
| B8 | Propane Radiant Floor Heating and Equipment | L.S. | 1 | | |
| B9 | Hangar Overhead Fan | L.S. | 1 | | |
| B10 | Water Service & Spigot | L.S. | 1 | | |
| | | | | **HANGAR 100' by 100':** | |
| **HANGAR 100' by 100' Alternate Bid Items** | | | | | |
| A2 | Hangar Floor Epoxy Seal Coating - 100'x100' Hangar (Non-AIP) | L.S. | 1 | | |
| | | | | | |
| **Hangar 120' by 100'** | | | | | |
| B1 | Pre-Engineered Building (Includes the building delivered to the site) | L.S. | 1 | | |
| B2 | General Construction Work (Includes floor slab, foundations, building erection, and excavation for the building. It does not include any site work beyond the building walls) | L.S. | 1 | | |
| B3 | Electrical (Includes Service Connection, main panel, overhead lighting, outlets, door operators) | L.S. | 1 | | |
| B4 | 100 Foot by 26 Foot Clear Opening One Piece Hydraulic | L.S. | 1 | | |
| B5 | Approach Apron 7 Inch, Concrete Pavement | S.Y. | 610 | | |
| B6 | ODOT 304 Aggregate Base | C.Y. | 102 | | |
| B7 | Floor Trench Drain | L.F. | 45 | | |
| B8 | Propane Radiant Floor Heating and Equipment | L.S. | 1 | | |
| B9 | Hangar Overhead Fan | L.S. | 1 | | |
| B10 | Water Service & Spigot | L.S. | 1 | | |
| | | | | **HANGAR 120' by 100':** | |
| **HANGAR 120' by 100' Alternate Bid Items** | | | | | |
| A3 | Hangar Floor Epoxy Seal Coating - 120'x100' Hangar (Non-AIP) | L.S. | 1 | | |

Instruction to Bidders: The Bid Bond or Certified Check submitted with the bid shall be for the amount of the highest cost hangar bid and its alternate items.

Basis of Award: The Airport Sponsor intends to construct the largest hangar within their budget and available grant funding.