Subgrade Exploration Report - Final
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio
S&ME Project No. 23170065D

PREPARED FOR:

ODOT District 4
2088 S. Arlington Road
Akron, OH 44306

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July 8, 2025

July 8, 2025

ODOT District 4
2088 S. Arlington Road
Akron, OH 44306

Attention: Mr. Thomas Powell, P.E.

Reference: **Subgrade Exploration Report - Final**
TRU-80-11.32 Truck Parking (PID 121698)
Hubbard, Trumbull County, Ohio
S&ME Proposal No. 23170065D

Mr. Powell:

In accordance with our revised proposal dated January 8, 2025, which was authorized on January 15, 2025, by ODOT District 4 (D4), S&ME has completed a Geotechnical Exploration for a proposed truck parking facility at the abandoned rest area along westbound IR 80 just west of the Ohio and Pennsylvania border in Hubbard, Ohio. The approximate location of this project is illustrated on the Vicinity Map included as Plate 1 in Appendix I of this report.

In accordance with Section 701 of the ODOT *Specifications for Geotechnical Explorations* (*SGE*), S&ME submitted a "draft" version of this report dated March 28, 2025, which was reviewed by ODOT District 4. Review comments were provided by District 4 on April 22, 2025. A draft version of Geotechnical Profile Sheets was submitted on June 20, 2025, and was reviewed by ODOT, with comments provided to S&ME on June 23, 2025. We are pleased to submit the final version of this report which addresses all review comments on our draft report and updates to the design details of the project. A final set of Geotechnical Profile Sheets was submitted separately on July 3, 2025.

We appreciate having been given the opportunity to be of service. Please do not hesitate to contact us if you have any further questions regarding this report.

Respectfully,

S&ME, Inc.

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Senior Engineer | Project Manager

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1.0 Executive Summary

An overview of this project and the findings of this geotechnical exploration are presented below. These findings should not be used in place of the more detailed recommendations presented in the remainder of this report.

Category *(Section Reference)*	**Project Overview/Geotechnical Findings**
Project Description *(Section 2.0)*	Construct a new truck parking facility at the site of an abandoned rest area along westbound IR 80, approximately 0.8 miles west of the Ohio/Pennsylvania state line. The project includes improvements to entrance and exit ramps and new concrete pavement in the parking areas.
Exploration Program *(Section 4.0)*	Eleven (11) borings were performed for the truck parking facility, associated ramps and proposed light towers. See Table 4-1 for a summary of the borings. Nine (9) borings were also completed for a proposed utility installation along the median of IR 80 prior to the work being cancelled.
Subsurface Conditions *(Section 5.0)*	*Surface Materials*: Seven (7) borings were advanced through existing pavement. Table 5-1 summarizes the type and thicknesses of pavement encountered. Four (4) borings performed outside areas of existing pavement encountered 9 to 12 inches of rootmat. *Existing Fill*: 1.6 to 2.0 feet of fill or possible fill consisting of stiff to hard cohesive (A-4a, A-6b) soils encountered in Borings B-010-1-25 and B-014-0-25. *Natural Soil*: Primarily stiff to hard cohesive soil (A-4a, A-4b, A-6a, A-7-6) with a layer of medium dense sandy silt (A-4a) in Boring B-016-0-25. *Bedrock*: Encountered in all borings except B-010-1-25 and consisted primarily of gray, highly to severely weathered and very weak to weak shale. Encountered at depths ranging from 1.3 to 10.5 feet below grade (El. 996.1 to El. 1025.6). *Groundwater*: Noted at depths of 16.0', 1.0', and 6.5' in Borings B-016-0-25, B-018-0-25 and B-021-0-25, respectively.
Subgrade Support Parameters *(Section 6.2.1)*	Average California Bearing Ratio (CBR) of 7%. Resilient Modulus (M_R) of 10,800 psi.
Subgrade Remediation *(Sections 6.2.2 and 6.2.3)*	Borings encountered multiple types of materials, including unstable soils (low N_{60} value and/or high moisture content), unsuitable soils (silt), and bedrock that the Subgrade Analysis spreadsheet indicates required subgrade remediation. S&ME recommends "Excavate and Replace" remediation, with overexcavations generally ranging from 6 to 12 inches below proposed subgrade. See Table 6-1 and Plates 7 through 9 in Appendix II for descriptions and exhibits of estimated subgrade remediation limits and recommended depths.
Groundwater Considerations *(Section 6.4)*	Significant groundwater issues are not anticipated in connection with the proposed construction. Construction surfaces should be graded to prevent pooling of water on the predominantly cohesive soils at the site.
Light Tower Foundations *(Section 7.0)*	Light tower foundations will be designed by the ODOT Office of Geotechnical Engineering (OGE). See Appendix I for logs of Borings B-014-0 through B-017-0 which were performed for the proposed light towers.

2.0 Introduction

This project includes the construction of a new truck parking area at the site of an existing, but abandoned, rest area in the westbound direction of IR 80 just west of the Ohio/Pennsylvania state line. Site improvements will include new concrete pavement in the driving lane between the gore areas of the existing ramps and the new truck parking area(s). The facility is proposed to accommodate approximately 42 truck parking spots.

On January 29, 2025, ODOT D4 requested that the original exploration program be modified to relocate four (4) embankment explorations to provide deeper subsurface information near proposed light towers that had been incorporated into the project.

Additionally, this exploration program also included performing borings for new water and sanitary sewer lines along the centerline of IR 80 to Elmwood Drive Exd. (approximately 7,000 feet west of the parking area). However, on February 5, 2025, ODOT D4 advised S&ME that changes to the proposed truck parking facility had removed the need for these explorations. S&ME indicated that 9 of these 13 borings had already been completed. ODOT then directed S&ME to non-perform the remainder of these utility borings and the proposed laboratory testing of samples from these borings, and to prepare and submit logs of the borings based on field descriptions from the utility borings completed on or prior to February 5, 2025. No additional information or recommendations regarding these utility borings are provided in this report.

This geotechnical exploration was performed in general accordance with the January 2025 ODOT *Specifications for Geotechnical Explorations* (*SGE*) and ODOT *Geotechnical Design Manual* (*GDM*).

3.0 Geology and Observations of the Project

3.1 Geology

This project lies within a previously glaciated portion of Ohio in the Killbuck-Glaciated Pittsburgh Plateau Physiographic Regions of Ohio. The soil overburden in this area typically consists of Wisconsinan-age clay and loam glacial till over Mississippian- to Pennsylvanian-age shales and sandstones. Based on available public source information, the site is in an upland area where bedrock is estimated to be near El. 1000 or higher. Water wells and historic boring information indicate bedrock as high as El. 1022. Bedrock was encountered in several of the borings performed for this project between El. 996.1 and El. 1025.6, which ranges from 1.3 to 10.5 feet below the approximate ground surface.

A review of the ODNR resources indicates the site is in an area not known to contain karst bedrock features and is not subject to severe slope failure. The ODNR online “Mines of Ohio” tool indicates there are no active or abandoned mines reported within or near the project limits.

3.2 Reconnaissance

S&ME visited the site on January 29, 2025, to observe current site conditions, look for potential utility conflicts, select and mark boring locations, and assess traffic control requirements at the proposed boring locations. The existing ramp pavement entering and exiting from the rest area appeared to be in fair condition, with. transverse

and longitudinal cracking noted throughout the ramps and IR 80 westbound shoulder. Several areas of the pavement were in worse condition, with significantly greater cracking and distress being evident. Within the abandoned rest area, existing floor slabs, concrete walks, or other abandoned pavement/structures were present at the existing ground surface, along with multiple piles of soil or fill materials covered with vegetation ranging from tall grasses to large, mature trees.

3.3 Available Information

Historic borings were located for this site in the ODOT TIMS database. Several of these borings consisted of roadway/embankment borings performed along the centerline of IR 80 in 1962. In addition, logs of borings performed for previous structures at the rest area, and a water well log, were also located. These borings indicated that the on-site soils would likely consist of predominantly discontinuous layers of SANDY SILT (A-4a), SILT (A-4b) and SILT AND CLAY (A-6a) with shale bedrock anticipated between El. 1003.4 and El. 1022. None of the historic borings were suitable for re-use as part of the requested subgrade/light tower investigation.

4.0 Exploration

4.1 Field Investigation

Between February 3 and 7, 2025, a total of 20 borings were performed. Eleven (11) borings were performed within the parking area vicinity to assess subgrade, embankment and foundation conditions for proposed improvements to ramps, parking areas and light towers. Table 4-1 provides a summary of the borings performed for the project, including their purpose and termination depth. For the remainder of this report, the borings will be referred to without the two-year designation. The approximate locations of these borings are shown on the Plan of Borings included as Plates 2A through 2D in Appendix I.

Table 4-1 – Summary of Project Borings

Boring ID	Termination Depth (ft)	Purpose
B-010-1-25	7.5	Subgrade
B-011-1-25	7.0	Subgrade
B-014-0-25	13.6	Embankment/Light Tower
B-015-0-25	19.0	Embankment/Light Tower
B-016-0-25	18.6	Embankment/Light Tower
B-017-0-25	23.8	Embankment/Light Tower
B-018-0-25	5.9	Subgrade
B-019-0-25	5.2	Subgrade
B-020-0-25	6.4	Subgrade
B-021-0-25	6.8	Subgrade
B-022-0-25	6.9	Subgrade

Nine (9) borings (B-001-0-25 through B-006-0-25, B-009-0-25, B-010-0-25 and B-011-0-25) were completed for the originally proposed utility improvements prior to S&ME being notified that the utility improvements were removed from the project scope. No further discussion of these utility borings will be provided in this report.

The borings were performed by truck- and ATV-mounted drilling rigs using a 3¼-inch I.D. hollow-stem auger to advance the borings between sampling attempts. Disturbed but representative soil samples were obtained by lowering a 2-inch O.D. split-barrel sampler to the bottom of the boring and then driving the sampler into the soil with blows from a 140-pound hammer freely falling 30 inches (AASHTO T206 - Standard Penetration Test). Six (6) feet of continuous SPT sampling was attempted in each subgrade boring, beginning near the anticipated subgrade level. Five (5) of the subgrade borings were terminated before advancing 6 feet below subgrade after encountering shallow shale bedrock. Borings performed for the proposed embankment and light poles were sampled at 2.5-foot intervals to depths ranging from 13.6 to 23.8 feet. SPT samples were examined immediately after recovery and representative portions were preserved in airtight glass jars. In accordance with the ODOT *SGE*, the hammer system on the drill rigs used for this exploration were calibrated in accordance with ASTM D4633 on December 30, 2024, with drill rod energies of 74.3% (ATV D50 Rig) and 98.0% (Mobile B-57 Rig). In accordance with the *SGE*, the energy ratio for the Mobile B-57 Rig has been limited to 90%.

Groundwater observations were made as the borings were being advanced, and again after the completion of drilling. At the completion of drilling, the borings were backfilled with soil cuttings mixed with bentonite and, where advanced through existing pavement, the surface of the road was repaired with cold-patch asphalt.

In the field, experienced S&ME personnel performed the following: 1) examined all samples recovered from the borings; 2) preserved representative portions of all samples in airtight glass jars; 3) prepared a log of each boring; 4) made seepage and groundwater observations; 5) made hand-penetrometer measurements in soil specimens exhibiting cohesion; and, 6) provided liaison between the field work and the Project Engineer so the exploration program could be modified in the event unusual or unexpected subsurface conditions were encountered. All recovered samples were transported to the soil laboratory of S&ME for further examination and testing.

4.2 Laboratory Testing

In the laboratory, moisture-content testing was performed on all recovered soil samples. Classification testing (liquid/plastic limit determinations and/or grain-size analyses) was performed on two (2) soil samples recovered from each subgrade boring. Sulfate testing was performed on a representative specimen obtained from within 3 feet of the approximate pavement subgrade level in each boring, except for Boring B-018-0 which encountered bedrock immediately beneath the granular base. The results of these laboratory tests are recorded numerically on the individual boring logs.

Based upon the results of the laboratory testing program, the field logs were modified, if necessary, and copies of the laboratory-corrected boring logs are submitted as Plates 5 through 24 of Appendix I. Shown on these logs are: descriptions of the soil stratigraphy encountered; depths from which samples were preserved; sampling efforts (blow-counts) required to obtain the specimens in the borings; calculated N_{60} values; laboratory testing results; seepage and groundwater observations made at the time of drilling; and, values of hand-penetrometer measurements made in soil samples exhibiting cohesion. For your reference, hand-penetrometer values are roughly equivalent to the unconfined compressive strength of the cohesive fraction of the soil sample.

Soils have been classified in general accordance with Section 603 of the ODOT *SGE* and described in general in accordance with Section 602. Bedrock has been classified and described in general accordance with Section 605 of the ODOT *SGE*. An explanation of the symbols and terms used on the boring logs, definitions of the special adjectives used to denote the minor soil components, description of rock, and information pertaining to sampling and identification are presented on Plate 3 and 4A/B of Appendix I. Group Indices determined from the results of the laboratory testing program are also provided on the boring logs.

5.0 Findings

5.1 Existing Surficial Materials

Pavement materials were encountered in all subgrade borings and the pavement materials encountered in these borings is summarized in Table 5-1. Nine (9) to 12 inches of rootmat was encountered in Borings B-014-0 through B-017-0 which were performed outside of the existing pavement.

Table 5-1 – Summary of Pavement Section Materials Encountered in Subgrade Borings

Boring ID	Asphalt (in.)	Concrete (in.)	Granular Base (in.)
B-010-1-25	12	-	5
B-011-1-25	11	-	7
B-018-0-25	3	8	5
B-019-0-25	11	-	7
B-020-0-25	8	7	3
B-021-0-25	18	-	6
B-022-0-25	9	-	9

5.2 Subsurface Stratigraphy

Beneath the surficial materials summarized in Section 5.1, existing fill and probable fill were encountered in Borings B-010-1 and B-014 to a depth of 3.0 feet and consisted of stiff to hard brown or black SANDY SILT (A-4a) or SILTY CLAY (A-6b). Below the fill in B-010-1 and B-014-0 and beneath the granular base or rootmat in the remaining borings, natural soil consisting of predominantly stiff to hard brown and/or gray SANDY SILT (A-4a), SILT (A-4b), SILT AND CLAY (A-6a) and CLAY (A-7-6) was encountered. A layer of medium dense SANDY SILT (A-4a) was present in Boring B-016-0 below these cohesive soils.

Shale bedrock was encountered in all borings except for Boring B-010-1 at depths ranging from 1.3 to 10.5 feet below existing grades (between El. 996.1 and El. 1025.6). The shale was described as gray, highly to severely weathered, and very weak to weak. Thin layers or seams of sandstone were observed in Borings B-017-0 and B-022-0.

5.3 Groundwater Observations

During drilling, free water was encountered in Borings B-016-0, B-018-0 and B-021-0 at depths of 16.0', 1.0' and 6.5', respectively. At the completion of drilling and removal of the augers from the boring, all boreholes except Boring B-016 were noted as being "dry". Water was measured at a depth of 17.4 feet at the completion of drilling in Boring B-016-0.

Groundwater measurements obtained from the borings should be considered as temporary, short-term observations and should not be assumed to be representative of the long-term static groundwater level.

5.4 Soil Sulfate Test Results

Sulfate content testing was performed in accordance with ODOT Supplement 1122 on samples of soil obtained from within 3 feet of the proposed subgrade level in each boring. The results of these tests ranged from less than 40 parts per million (ppm), the minimum reported limit, to 540 ppm. These results are below the threshold value of 5,000 ppm that has been identified by the ODOT *GDM* as the sulfate concentration above which chemical stabilization should not be performed. The results of these tests are reported on the individual boring logs and on Plate 25 in Appendix I.

6.0 Analysis and Recommendations

6.1 General Discussion

S&ME was provided a status set of Stage 2 plans for review on February 21, 2025. These plans indicate the following improvements are being proposed:

- Widening/reconstruction of the left side of the existing acceleration ramp between approximate Sta. 3+00 to Sta. 6+10.
- Construction of a 32-foot-wide (including shoulder) separate driving/exit lane to the left of the existing through-lane between Sta. 6+10 and Sta. 9+00.
- East (upstation) of Sta. 9+00, this driving lane begins to widen to encompass the truck parking area, extending to a maximum width of approximately 263 feet. This widened parking area then decreases in width after Sta. 14+00 and returns to the 32-foot-wide lane by Sta. 20+93.
- This 32-foot-wide lane (separate from the through lane) continues from Sta. 20+93 to Sta. 22+77, where it merges into the existing deceleration ramp pavement.
- As the truck parking area widens to the north of the driving lane, as much as 6.5 feet of new fill will be placed near the northern edge of the project of the parking area. This fill will be placed to the north of the driving lane from approximately Sta. 10+50 to Sta. 14+50.
- From Sta. 15+00 to Sta. 16+50, up to approximately 4.5 feet of existing materials will be cut to accommodate the widened parking area.
- Resurfacing of the existing deceleration ramp will be performed from Sta. 22+77 to Sta. 632+34 (IR 80 Centerline stationing), a distance of approximately 912 feet.
- Four light towers will be installed around the northern boundary of the widened parking area.
- An outbuilding and/or shed will be constructed to the north of the parking area. This outbuilding is being designed by others and was not included in our exploration.

6.2 Subgrade Assessment

6.2.1 Subgrade Support Parameters

Section 600 of the ODOT *GDM* provides a standard approach to performing explorations and assessing roadway subgrades. The associated spreadsheet (Ver. 14.7, updated 11/6/2024) created by the ODOT Office of Geotechnical Engineering (OGE) is used to estimate roadway subgrade support parameters and identify areas requiring remediation. The spreadsheet (see Appendix II) summarizes the soil type (by ODOT/HRB classification), group indices, depth, blow-counts, Atterberg Limit, and sulfate content values of the proposed subgrade soils encountered in the borings drilled for this project. Using this data, this spreadsheet computes an average of the estimated values of the California Bearing Ratio (CBR) for the soils encountered at or below the anticipated subgrade level of the proposed roadway profile.

Based on the assumed profile elevation data for the widened pavement, the following average California Bearing Ratio (CBR) has been computed by the ODOT Subgrade Analysis spreadsheet for use during new pavement design based on the anticipated subgrade soils encountered in the borings performed for this project.

$$CBR = 9\%$$

Based on this average CBR value and Section 203.1 of the current ODOT *Pavement Design Manual* (*PDM*), the following value of Resilient Modulus (M_R) correlates to this average CBR value.

$$M_R = 10{,}800 \text{ psi}$$

These subgrade support values may be used during new pavement thickness design for this project provided that the entire proposed pavement subgrade is prepared in strict accordance with Item 204 of the ODOT *CMS*, and that all borrow soil placed within 3 feet of the final subgrade elevation of the new pavement provides average subgrade support parameters which meet or exceed the above values. This subgrade evaluation also assumes that the subgrade for the new roadway pavements is composed of the materials encountered in the borings. If, at the time of construction, it is determined that the subgrade consists of materials different than those encountered in the borings, the pavement design subgrade criteria should be reviewed and, if necessary, modified.

6.2.2 Subgrade Remediation Assessment

The ODOT Subgrade Analysis spreadsheet also identifies subgrade soils which are "unsuitable" either by classification (A-4b, A-2-5, A-5, A-7-5, A-8a, A-8b) or if the Liquid Limit value is greater than 65%. The spreadsheet also determines if a subgrade soil may be potentially "unstable" and possibly require subgrade remediation by comparing the lab-measured moisture content to the estimated optimum moisture content of the subgrade soil, and/or by comparing the normalized blow-count (N_{60}) and the lowest N value (N_{60L}) from SPT sampling.

Based on these comparisons and correlations, the Subgrade Analysis spreadsheet provides alternative approaches to remediate and establish a stable soil subgrade using either "excavate and replace" (ODOT *CMS* Item 204) or chemical stabilization (*CMS* Item 206 and Supplement 1120). However, soils with a sulfate content above 5,000 ppm are generally prohibited from being chemically stabilized.

The subgrade remediation depths identified by the Subgrade Analysis spreadsheet presented in Appendix II are based on the conditions encountered in the borings during this subsurface investigation. However, because the required amount of remediation is dependent on the moisture content of the subgrade soil at the time of construction, Section 600 of the ODOT *GDM* states that the ultimate decision on required remediation depths and limits should be based on observations during either proofrolling or test-rolling operations at the time of construction.

Based on the results of the borings and the Subgrade Analysis spreadsheet, soil classified as being unsuitable (A-4b, SILT) was encountered in Borings B-019-0 and B-022-0. If this unsuitable soil is encountered, it should be completely removed or be removed to a depth of 36 inches below the proposed subgrade. The overexcavated silt should then be replaced with compacted suitable borrow soil that meets or exceeds the design CBR value (see Section 6.2.1) or be chemically stabilized to a depth of 14 inches.

Two (2) of the borings (B-011-1 and B-018-0) encountered bedrock within 6 inches of the proposed subgrade. In these areas, the bedrock should be overexcavated and replaced in accordance with Section 600 of the *GDM*.

Additionally, three (3) of the remaining borings encountered soil at or just below the proposed subgrade level with characteristics defined by the Subgrade Analysis spreadsheet as being problematic (excessive soil moisture content, low N_{60} value or hand penetrometer value) and which may require remediation by the procedures recommended in the subgrade analysis. Typical options for subgrade remediation include Item 204 "Excavate and Replace", either with or without geogrid, or chemical stabilization.

Because of the various types of potential subgrade issues at this site, the Subgrade Analysis spreadsheet does not provide a recommended method or depth of global subgrade remediation for the various pavement subgrade areas at this site (ramps, IR 80 shoulder and truck parking). Accordingly, we recommend that areas where unsuitable/unstable soils or shallow bedrock are encountered at this site be remediated using the "excavate and replace" method.

6.2.3 Recommended Subgrade Remediation – "Excavate and Replace"

Table 6-1 outlines the estimated areas and limits where the need for "excavate and replace" subgrade remediation may be required based on the results of the subgrade analysis. An exhibit showing the estimated areas described in Table 6-1 is provided on Plates 7 through 9 of Appendix II.

Table 6-1 – Estimated "Excavate and Replace" Subgrade Remediation Areas

Approximate Station Range	Recommended Remediation	Width Limits
CL of Construction Sta. 3+00 to Sta. 8+50 Entire full depth pavement area	Excavate and Replace – 12" (Unstable Soils)	18 inches beyond the edge of the pavement, including under new curbs or shoulders
CL of Construction Sta. 8+50 to Sta. 16+50 From right edge of full depth pavement to ~50 feet left of centerline	Excavate and Replace – 6" (Bedrock)	
CL of Construction Sta. 10+20 to Sta. 13+50 From ~50 feet left of centerline to left edge of full depth pavement	Excavate and Replace – 12" (Unstable Soils)	
CL of Construction Sta. 16+50 to Sta. 20+50 Entire full depth pavement area	Excavate and Replace – 6" (Silt)	

In accordance with Section 608 of ODOT *GDM*, Item 712.09 Geotextile Fabric Type D should be placed at the base of all undercuts, and be backfilled with Item 204 Granular Material, Type B or C. It is also recommended that all overexcavated subgrade areas that are backfilled with granular soil be drained to an underdrain, catch basin, or pipe, if possible.

All backfill and geotextile should be placed according to the specifications of ODOT Item 204. It should be noted, however, that ODOT *GDM* specifies that Item 204 Granular Material Type B without a geotextile fabric be utilized to backfill undercuts performed in the vicinity of any underdrains. As such, underdrains should be installed before placing geotextile and granular backfill. **As "excavate and replace" is recommended for subgrade remediation, Plan Note G121 from the ODOT *Location and Design Manual* (*L&D*), Vol. 3 should be included in the plans**.

Because of the variable nature of the wide spacing of the explorations, it is possible that additional areas of unsuitable soils or shallow bedrock may be encountered during earthwork and proofrolling operations. Visual observation of the proofrolling procedures by the Geotechnical Engineer of Record may potentially result in a reduction of overexcavation of unsuitable soils in these areas.

The estimated subgrade remediation depths are based on conditions encountered in the borings during this subsurface exploration. However, because the required amount of remediation is dependent on the materials encountered and moisture content of the subgrade soil at the time of construction, the ultimate decision on required remediation depths and limits should be based on observations during either proof rolling or test-rolling operations.

The depths of known or proposed utilities should be taken into consideration with the proposed remediation of existing subgrade soils within the project area.

6.3 General Roadway/Pavement Construction Considerations

Based on the status set Stage 2 plan and profile information provided to S&ME, we are providing the following recommendations for consideration during preparation and construction of the subgrade or embankment for this project.

6.3.1 Subgrade Preparation

Prior to the commencement of earthwork operations, it is recommended that all existing pavement, granular base, grass, topsoil, vegetation, and other miscellaneous materials be completely removed from the entire footprint of the proposed pavement subgrades. Following the removal of these materials, it is recommended that the entire exposed subgrade be examined by the Geotechnical Engineer of Record or their designated representative to identify any weak, wet, organic, or otherwise unsuitable soils that were not encountered during the subsurface exploration. Any such materials identified should be removed and replaced with suitable compacted fill (ODOT *Construction and Material Specifications*, *CMS*, Item 204, or Item 203 when more than 12 inches below the proposed subgrade). Test rolling (Item 206.04) of these areas prior to commencing fill placement may assist in identifying soft weak and wet areas.

Existing underground utilities are anticipated beneath the proposed pavement areas, and the type of material used and the relative compactness of backfill within any such utility trenches are unknown. S&ME recommends any planned utility relocation or removal be performed prior to final subgrade proofrolling. Some instability of utility trench backfill may occur during earthwork operations and/or proofrolling, and some recompaction of granular utility trench backfill may become necessary. Additionally, if water has accumulated within the utility backfill, the subgrade soil in the vicinity of any saturated utility trenches may have become sufficiently weak, soft, and/or wet that proofrolling may identify these additional areas as requiring overexcavation and replacement. In any case, care should be taken not to disturb any shallow utilities during proofrolling or overexcavation activities.

6.3.2 "At-Grade"/"Cut" Soil Subgrade Areas

Once the desired soil subgrade elevation has been attained in all "at-grade" and "cut" subgrade areas, the subgrade soil beneath the entire new pavement areas should be scarified and recompacted to a depth of 12 inches below the subgrade level in accordance with ODOT *CMS* Item 204.03. During recompaction, the moisture content of the subgrade soil should be maintained or adjusted in accordance with ODOT *CMS* Item 203.07.A.

Following the completion of the scarification and recompaction of the subgrade in these "cut"/"at-grade" areas, it is strongly recommended that construction traffic be restricted from traveling on the compacted subgrade until final acceptance proofrolling has been performed. Cohesive subgrade soils subjected to repeated moisture fluctuations resulting from exposure to rainfall and/or surface water runoff, may exhibit subgrade instability.

6.3.3 "Fill" Areas

Prior to commencing fill placement in pavement areas to attain the proposed subgrade in the northern portion of the proposed parking area, S&ME recommends that consideration be given to performing Item 206.04 Test Rolling on all exposed embankment foundation areas beneath areas where new fill is required. Test rolling, performed in accordance with Item 204.06 of the ODOT *CMS* and Section 204 of the ODOT *Construction Administration Manual of Procedures*, would assist in identifying soft, wet, or weak zones, or areas of unsuitable, organic, or highly plastic soil that may be present. If any such zones of soft, wet, or weak soils are present, the

materials contained in these zones should be scarified, dried, and thoroughly recompacted in place in accordance with ODOT *CMS* Item 203.07. If unsuitable or organic soils are encountered, these materials should be completely removed and the overexcavation filled in a controlled manner with compacted, suitable embankment material (*CMS* Item 203.02) which meet the additional requirements previously discussed in Section 6.2.1 and discussed later in Section 6.3.5.

Soft, weak, wet, or unsuitable soils that are not removed from beneath a thin layer of fill may result in difficulties achieving the compaction percentages required for the new fill (ODOT *CMS* Items 203.07 or 204.03) such that final subgrade acceptance proofrolling may require overexcavation of the new fill where weak soils were "bridged" by a minimal thickness of new fill. Although the ODOT *CMS* Item 203.05 permits the use of a "bridge lift" to aid in spanning soft or wet foundation areas, S&ME recommends that this practice not be permitted unless more than 3 feet of new embankment fill placement is required.

A review of the status set Stage 2 plans indicates that the inclination of existing grade ranges from approximately 4H:1V to 10H:1V (or flatter) and proposed new fill embankment slopes ranging from 4H:1V to 7.5H:1V in the northern portion of the site where new fill will be placed to attain proposed grades. Based on these shallow existing and proposed slope inclinations, the presence of existing stiff to hard cohesive soils and relatively shallow bedrock below the proposed new fill, S&ME believes that, properly constructed, these new fill slopes will be stable, and as such, stability analyses were not performed.

6.3.4 Benching

After all unsuitable materials have been removed and prior to commencing fill placement, it is recommended that horizontal benches be cut into all existing sloping surfaces steeper than 8(H):1(V) to permit placement and compaction of new fill in horizontal lifts. Where new fill is to be placed on an existing ground surface with a slope between 8(H):1(V) and 4(H):1(V), S&ME recommends that benching of the existing ground be performed in accordance with Item 203.05 of the ODOT *CMS*. At locations where the existing ground surface is steeper than 4(H):1(V), S&ME recommends "Special Benching" procedures as outlined in Section 800 of the ODOT *GDM*. **If "Special Benching" is required, Plan Note G109 from the ODOT *L&D Manual, Vol. 3*, should be included in the General Notes**.

During any required Special Benching procedures, S&ME also recommends the following: 1) only one bench be exposed at any given time and that excavation of the next bench should not be permitted until embankment fill placement and compaction has been completed to the top of the backslope of the previous bench; and, 2) the length of any given bench that is exposed should not exceed the quantity of embankment fill which may be properly placed and compacted in one day. Additionally, S&ME recommends that the final, completed side slopes of embankments be constructed no steeper than 2(H):1(V).

6.3.5 Borrow Requirements and Compaction Criteria

Soil used as fill/backfill should consist of inorganic soil free of all miscellaneous materials, cobbles, and boulders, which is placed in uniform, thin layers and then compacted in accordance with

- *CMS* Item 203 when below 12 inches of the proposed subgrade level;
- *CMS* Item 204 when within 12 inches of the proposed subgrade level; and

Borrow materials should not be placed in a frozen condition or upon a frozen surface, and any sloping surfaces on which new fill is to be placed should first be benched in accordance with either ODOT *CMS* Item 203.05 or Section 800 of the ODOT *GDM*, depending on the slope of the existing ground surface at each location.

Borrow materials to be used as new fill or backfill within 3 feet of the proposed subgrade level should be tested in the laboratory to determine that the borrow materials exhibit subgrade support characteristics that are no less than the CBR value used during the pavement design (see Section 6.2.1).

Compaction requirements (based on the dry unit weight of the type of soil fill being placed as borrow) for the construction of embankment/subgrade materials are based on

- *CMS* Item 203.07.B when below 12 inches of the proposed subgrade level;
- *CMS* Item 204.03 when within 12 inches of the proposed subgrade level; and

S&ME also recommends that once the source of borrow for this project is determined, sampling and testing of this borrow material be performed prior to construction to verify that the borrow soils are suitable for the planned construction.

6.3.6 Moisture Conditioning and Subgrade Protection

Moisture conditioning and protection of pavement subgrade areas, before and after compaction, should be performed in accordance with *CMS* Item 203, including maintaining drainage as discussed in *CMS* Item 203.04.A. The predominantly cohesive soils encountered in the borings performed for this project are susceptible to absorbing additional moisture and weakening.

6.3.7 Final Subgrade Preparation

The subgrade should be proof rolled in accordance with *CMS* Item 204.06, with any weak or unstable areas being repaired. S&ME recommends that construction traffic be minimized once the required subgrade level has been attained.

6.4 Groundwater Considerations During Construction

Based upon observations made at the time of this investigation, significant groundwater problems are not anticipated in connection with the proposed construction. The new pavement subgrade should be graded to prevent surface runoff from pooling on the cohesive soils during construction as exposure of cohesive soils to moisture will result in a decrease in strength and an increase in compressibility. Soil softened by standing water or disturbed by construction activities should be removed before proceeding with construction.

In addition to proper subgrade preparation, we recommend that the pavement design and construction include surface and subsurface drainage measures. Water which infiltrates the pavement and remains trapped within the pavement components during traffic loading is one of the leading causes of premature pavement failure. Effective design measures include the use of perforated underdrain pipes or finger drains below pavements and/or the use of perimeter swales, perimeter edge drains, curbs, or a combination of these features to collect surface water runoff from areas adjacent to the pavement. Cohesive subgrade soils should be crowned or sloped to promote drainage of infiltrating water towards subsurface drainage collection systems.

7.0 Light Tower Foundations

Based on discussions with ODOT D4, light tower foundations will be designed by the ODOT Office of Geotechnical Engineering (OGE) based on the information provided in the borings performed at/near the proposed light towers. Please see Appendix I for logs of Borings B-014-0 through B-017-0 which were performed in the vicinity of the proposed light towers. Each of these explorations encountered shale bedrock at depths ranging from 5.5 to 10.5 feet below existing grade.

8.0 Limitations and Final Considerations

This draft report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

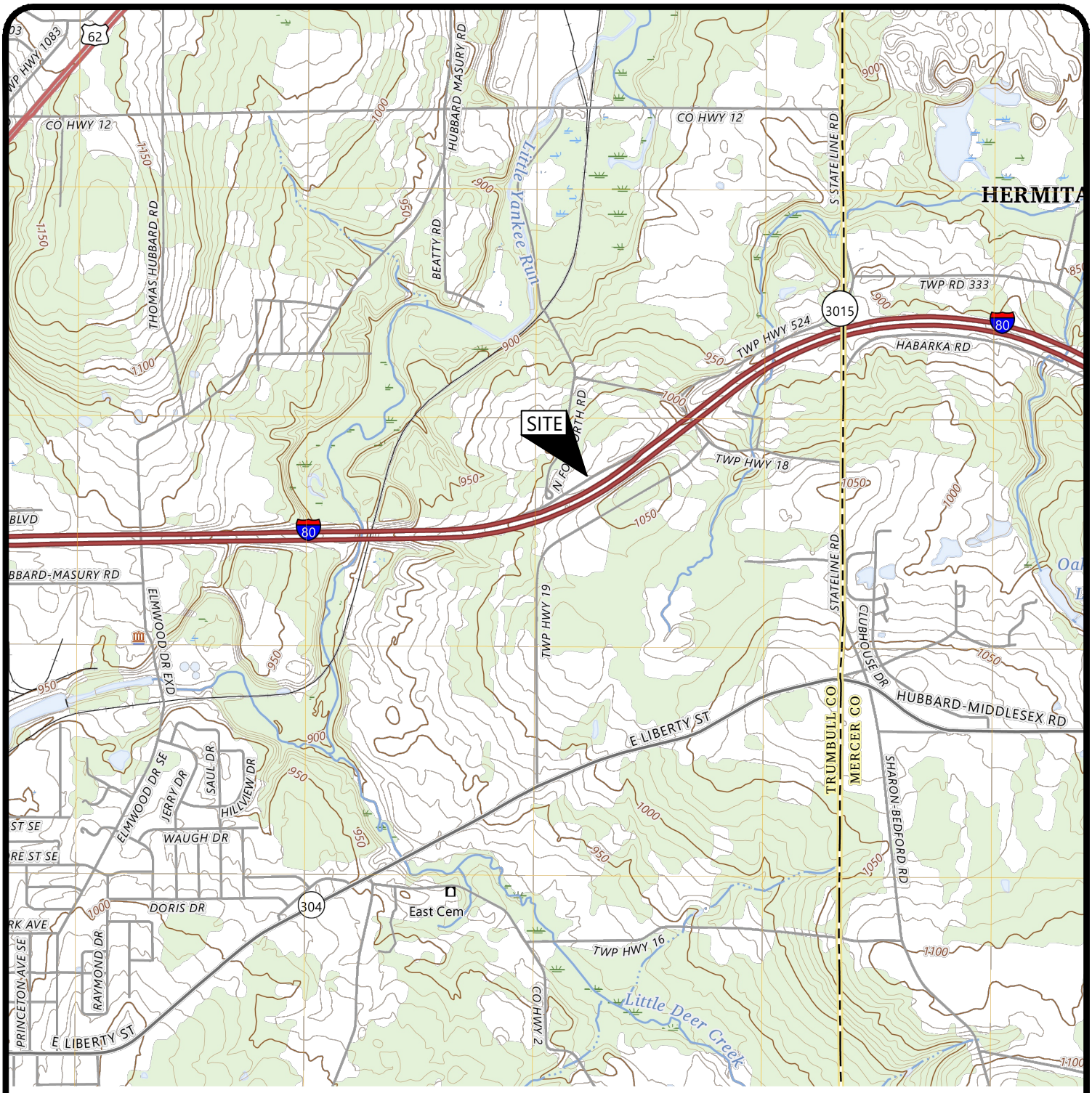
Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

Appendices

Appendix I



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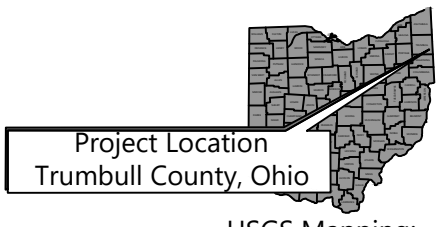


USGS Mapping:
Sharon West USGS Quad

0 2000 4000

GRAPHIC SCALE (IN FEET)

Vicinity Map

Subgrade & Light Tower Exploration
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	1
DATE:	
03-05-2025	
PROJECT NUMBER	
23170065D	

Drawing Path: T:\Columbus-1170\Projects\2023\23170065D_ODOT D4_TRU-80 Truck Parking_Hubbard OH\GEO\CAD\DWG\Plan of Borings & VMAP.dwg

NOTES: AERIAL IMAGERY COURTESY OF OGRIP, OBTAINED SPRING 2017.

LEGEND

B-001-0-25 S&ME SUBGRADE BORING NUMBER AND LOCATION

B-001-0-25 S&ME EMBANKMENT/LIGHT TOWER BORING NUMBER AND LOCATION

B-001-0-25 S&ME UTILITY BORING NUMBER AND LOCATION

0 400 800

GRAPHIC SCALE (IN FEET)

PLAN OF BORINGS

Subgrade and Light Tower Exploration
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	2A
DATE:	
03-28-2025	
PROJECT NUMBER	
23170065D	

NOTES: AERIAL IMAGERY COURTESY OF OGRIP, OBTAINED SPRING 2017.

LEGEND

B-001-0-25 S&ME SUBGRADE BORING NUMBER AND LOCATION

B-001-0-25 S&ME EMBANKMENT/LIGHT TOWER BORING NUMBER AND LOCATION

B-001-0-25 S&ME UTILITY BORING NUMBER AND LOCATION

0 400 800

GRAPHIC SCALE (IN FEET)

PLAN OF BORINGS

Subgrade and Light Tower Exploration
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	2B
DATE:	
03-28-2025	
PROJECT NUMBER	
23170065D	

NOTES: AERIAL IMAGERY COURTESY OF OGRIP, OBTAINED SPRING 2017.

LEGEND

B-001-0-25 S&ME SUBGRADE BORING NUMBER AND LOCATION

B-001-0-25 S&ME EMBANKMENT/LIGHT TOWER BORING NUMBER AND LOCATION

B-001-0-25 S&ME UTILITY BORING NUMBER AND LOCATION

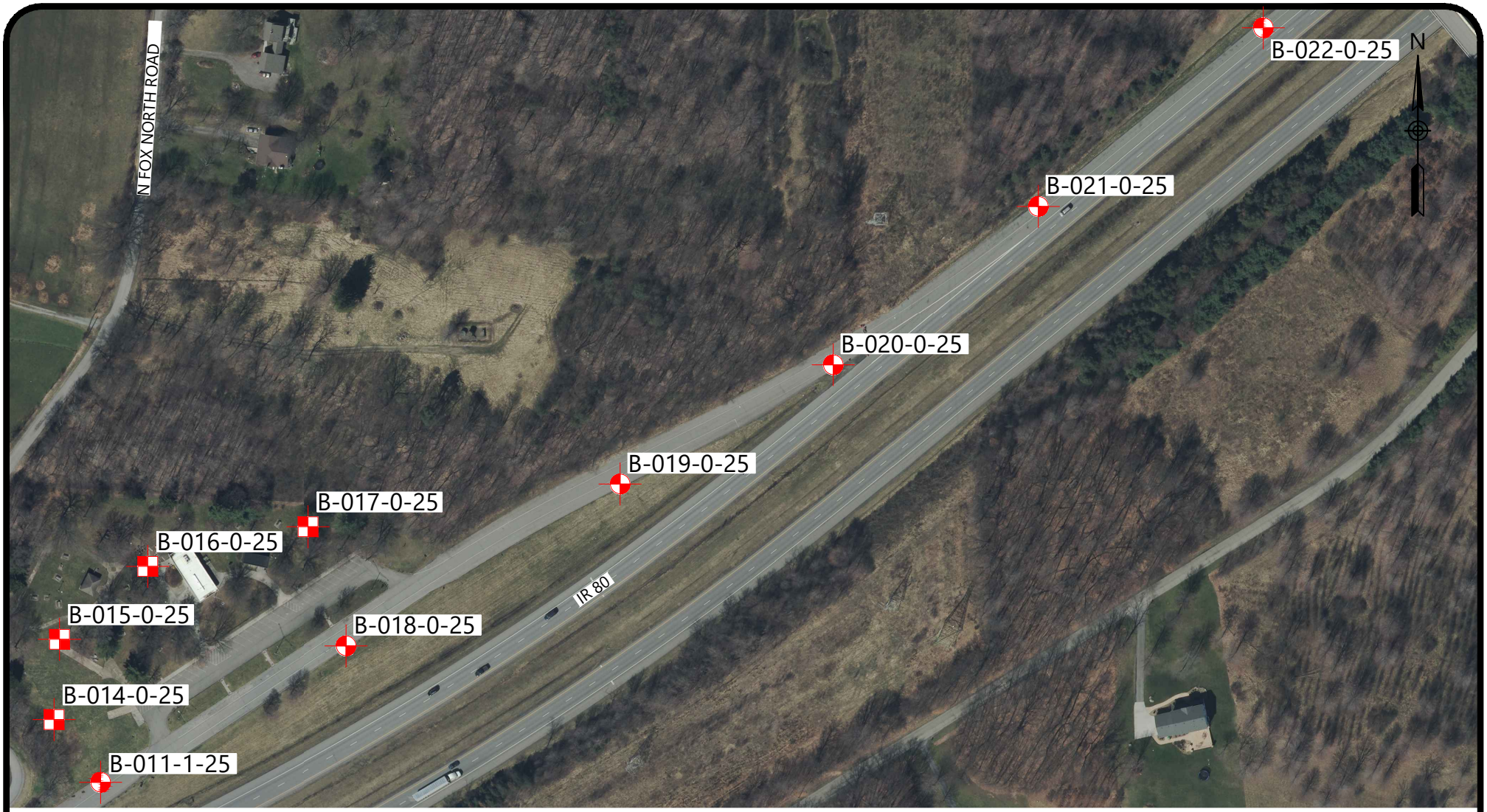
0 400 800

GRAPHIC SCALE (IN FEET)

PLAN OF BORINGS

Subgrade and Light Tower Exploration
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	2C
DATE:	
03-28-2025	
PROJECT NUMBER	
23170065D	



NOTES: AERIAL IMAGERY COURTESY OF OGRIP, OBTAINED SPRING 2017.

LEGEND

B-001-0-25 S&ME SUBGRADE BORING NUMBER AND LOCATION

B-001-0-25 S&ME EMBANKMENT/LIGHT TOWER BORING NUMBER AND LOCATION

B-001-0-25 S&ME UTILITY BORING NUMBER AND LOCATION

0 400 800

GRAPHIC SCALE (IN FEET)

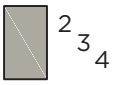
PLAN OF BORINGS

Subgrade and Light Tower Exploration
TRU-80-11.32 Truck Parking
Hubbard, Trumbull County, Ohio

SCALE:	FIGURE NO.
GRAPHIC	2D
DATE:	
03-28-2025	
PROJECT NUMBER	
23170065D	

ODOT SOIL LOG LEGEND

The STANDARD PENETRATION TEST (SPT) as defined by AASHTO T206 (or ASTM D1586) is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments (see graphic at right) with a 140 lb. hammer freely falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The SPT N Value is determined by adding the number of blows from the 2nd and 3rd 6-inch increments.



SPT BLOWCOUNT CORRECTION FOR HAMMER EFFICIENCY (N_{60}) is determined by the following equation: $N_{60} = N * [$ Drill Rod Energy Ratio (%) / 60], and where the drill rod energy ratio is determined in accordance with ASTM D4633. If the drill rod energy ratio exceeds 90%, it is limited to 90% to determine the N_{60} value and is shown on the log as 90*.

SHELBY TUBE (ST) samples are obtained by hydraulically pushing a thin-walled tube (typically 3-inches in diameter) to obtain a relatively undisturbed sample for testing of fine-grained soils to determine engineering properties such as strength, compressibility, permeability, and density. Shelby tubes are sampled in general accordance with ASTM D1587 (AASHTO T207).

DESCRIPTIVE ORDER OF SOIL STRATA: Consistency/Density, color, ODOT soil classification description, minor soil constituents with percentage modifiers, organic content, miscellaneous constituents or descriptions, relative moisture condition.

ODOT SOIL CLASSIFICATION DESCRIPTION AND SYMBOL

- **GRAVEL** (A-1-a)
- **GRAVEL WITH SAND** (A-1-B)
- **FINE SAND** (A-3)
- **COARSE AND FINE SAND** (A-3a)
- **GRAVEL WITH SAND AND SILT** (A-2-4 OR A-2-5)
- **GRAVEL WITH SAND, SILT AND CLAY** (A-2-6 OR A-2-7)
- **SANDY SILT** (A-4a)
- **SILT** (A-4b)
- **ELASTIC SILT AND CLAY** (A-5)
- **SILT AND CLAY** (A-6a)
- **SILTY CLAY** (A-6b)
- **ELASTIC CLAY** (A-7-5)
- **CLAY** (A-7-6)
- **ORGANIC SILT** (A-8a)
- **ORGANIC CLAY** (A-8b)
- **PEAT**
- **UNCONTROLLED FILL**
- **BOULDERY ZONE**
- **SOD/ROOTMAT/ TOPSOIL**
- **PAVEMENT OR BASE**
- **CONCRETE**

SOIL LOG SYMBOLS

SS - Split-Spoon Sample

ST - Shelby Tube Sample

TR - Top of Rock

REC - Sample Recovery, %

HP - Hand Penetrometer Value, tsf

LOI - Loss on Ignition Test, %

Qu - Unconfined Compressive Strength

γd - Dry Unit Weight, pcf

γm - Moist Unit Weight, pcf

GR - Gravel Content, %

CS - Coarse Sand Content, %

FS - Fine Sand Content, %

SI - Silt Content, %

CL - Clay Content, %

LL - Liquid Limit

PL - Plastic Limit

PI - Plasticity Index

WC - Natural Water Content, %

NOTE: Particle size contents are expressed % by weight.

PARTICLE SIZE

Particle	Size	US Sieve Size
Boulder	>300 mm (12 in.)	12 in.
Cobble	75 - 300 mm (3 - 12 in.)	3 - 12 in.
Coarse gravel	19 - 75 mm (3/4 - 3 in.)	3/4 - 3 in.
Fine gravel	2 - 19 mm (0.08 - 3/4 in.)	#10 - 3/4 in.
Coarse sand	0.42 - 2.0 mm	#40 - #10
Fine sand	0.074 - 0.42 mm	#200 - #40
Silt	0.005 - 0.074 mm	NA
Clay	< 0.005 mm	NA

FINE-GRAINED SOIL
(Relative Consistency)

	N_{60}	HP
Very soft	< 2 bpf	< 0.25 tsf
Soft	2 - 4 bpf	> 0.25 - 0.5 tsf
Medium stiff	5 - 8 bpf	> 0.5 - 1.0 tsf
Stiff	9 - 15 bpf	> 1.0 - 2.0 tsf
Very stiff	16 - 30 bpf	> 2.0 - 4.0 tsf
Hard	> 30 bpf	> 4.0 tsf

COARSE-GRAINED SOIL
(Relative Density)

	N_{60}
Very loose	< 5 bpf
Loose	5 - 10 bpf
Medium dense	11 - 30 bpf
Dense	31 - 50 bpf
Very dense	> 50 bpf

MINOR CONSTITUENTS
(% By Weight)

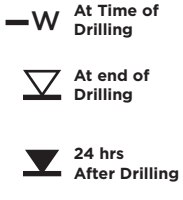
	Percentage
Trace	0% - 10%
Little	>10% - 20%
Some	>20% - 35%
"And"	≥ 35%

ORGANIC CONTENT OF SOIL
(Determined by ASTM D2974 or AASHTO T267)

Classification	Percentage
Slightly organic	2% - 4%
Moderately organic	>4% - 10%
Highly organic	> 10%

RELATIVE MOISTURE CONDITION

Dry	Cohesive - Powdery, WC well below PL Granular - No moisture present
Damp	Cohesive - Leaves very little moisture when pressed, WC < PL Granular - Internal moisture, little to no surface moisture
Moist	Cohesive - Leaves moisture when pressed, PL < WC < LL - 3 Granular - Free water on surface, shiny appearance
Wet	Cohesive - Mushy, WC near or above LL Granular - Voids filled with free water



Free water (seepage or groundwater) observation made anytime during the drilling process. Depending on time of reading and drilling methodologies, this value may be influenced by the drilling process.

Free water measurement soon after the drilling processes are complete, and the borehole is at final depth. Drilling fluids, if introduced during drilling, may influence this measurement.

Free water measurements made in a borehole hours to days after drilling is complete including the time elapsed (i.e., "24 hrs" as shown at left). Depending on subsurface conditions, elapsed time, drilling process, etc. this observation may reflect a stabilized level.

REFERENCES:

Ohio Department of Transportation (ODOT), Specifications for Geotechnical Explorations (SGE)

ODOT ROCK CORE LOG LEGEND

DESCRIPTIVE ORDER FOR ROCK STRATA

Bedrock type, color, weathering, strength, texture, bedding, other descriptors, type and condition of discontinuities, unit RQD, unit recovery.

When alternating layers occur between two distinct rock types, describe the material as "Interbedded" with the major rock type first, with estimated percentage, and the secondary rock type second, with estimated percentage. Provide the unit RQD and unit recovery, then describe each rock type in detail.

For spread footings founded on or into bedrock, describe discontinuities using the modified Rock Mass Rating (RMR) system (degree of fracturing, aperture width and surface roughness). For drilled shafts extending into bedrock, describe discontinuities using the Geologic Strength Index (GSI) system (discontinuity structure and surface condition). For rock cut slopes, describe discontinuities using both the modified RMR and GSI systems.

COMMON OHIO BEDROCK TYPES AND SYMBOLS


SHALE


SILTSTONE


LIMESTONE

COAL


CLAYSTONE/ MUDSTONE


SANDSTONE


DOLOMITE


UNDERCLAY/ FIRECLAY

WEATHERING

Unweathered	No evidence of chemical or mechanical alternation of the rock mass. Mineral crystals have a bright appearance with no discoloration. Fractures show little or no staining on surfaces.
Slightly Weathered	Slight discoloration of the rock surface with minor alterations along discontinuities. Less than 10% of the rock volume presents alteration.
Moderately Weathered	Portions of the rock mass are discolored with a dull appearance. Surfaces may have a pitted appearance with weathering "halos". Isolated zones of varying rock strengths.
Highly Weathered	Entire rock mass appears discolored and dull. Some pockets of slightly to moderately weathered rock and some areas of severely weathered materials may be present.
Severely Weathered	Majority of the rock mass reduced to a soil-like state. Zones of more resistant rock may be present, but the material can generally be molded and crumbled by hand pressures.

STRENGTH

		APPROX. UNCONFINED COMPRESSIVE STRENGTH (PSI)
Extremely Strong	Cannot be scratched by a knife or sharp pick. Chipping off hand specimens requires hard repeated blows of a geologist's hammer.	> 30,000
Very Strong	Cannot be scratched by a knife or sharp pick. Breaking off hand specimens requires hard repeated blows of a geologist's hammer.	30,000 - 15,000
Strong	Can be scratched with a knife or pick with difficulty. Requires hard hammer blows to detach hand specimen.	15,000 - 7,500
Moderately Strong	Can be scratched with a knife or pick. Gouges ¼" deep can be excavated by a pick. Requires moderate hammer blows to detach specimen.	7,500 - 3,600
Slightly Strong	Can be gouged 0.05 inch deep by firm pressure with a knife or pick point. Can excavate small pieces (1-inch) by hard blows with a pick.	3,600 - 1,500
Weak	Can be gouged readily by a knife or pick or excavated in small fragments by moderate blows of a pick. Small, thin pieces can be broken by hand.	1,500 - 750
Very Weak	Can be carved with a knife and excavated readily with a pick. Pieces 1 inch or more thick can be broken by hand. Can be scratched by fingernail.	750 - 40

TEXTURE

Boulder	> 12 in.
Cobble	12 - 3 in.
Gravel	3 - 0.08 in.
Coarse Sand	0.08 - 0.02 in.
Medium Sand	0.02 - 0.01 in.
Fine Sand	0.01 - 0.005 in.
Very Fine Sand	0.005 - 0.003 in.

BEDDING

Very Thick Bedded	> 36 in.
Thick Bedded	36 in. - 18 in.
Medium Bedded	18 in. - 10 in.
Thin Bedded	10 in. - 2 in.
Very Thin Bedded	2 in. - 0.4 in.
Laminated	0.4 in. - 0.1 in.
Thinly Laminated	< 0.1 in.

REFERENCES: OHIO DEPARTMENT OF TRANSPORTATION (ODOT), SPECIFICATIONS FOR GEOTECHNICAL EXPLORATIONS (SGE).

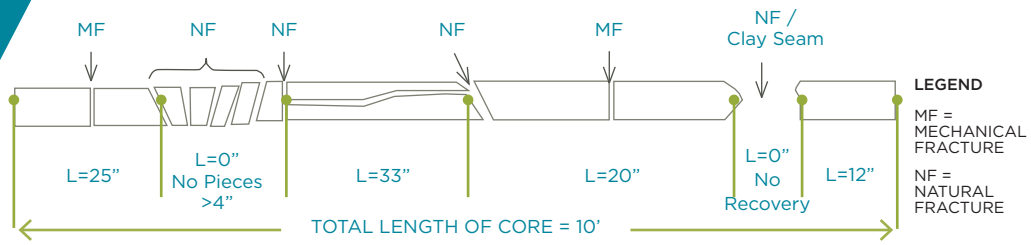
ODOT ROCK CORE LOG LEGEND

ROCK CORE RECOVERY

Recovery to be determined by core run and by rock unit (layer).

$$\text{REC}_{\text{(Recovery)}} = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \times 100$$

ROCK QUALITY DESIGNATION (RQD)



$$\text{RQD}_{\text{(Equation)}} = \left(\frac{\Sigma \text{ Core with Length (L)} \geq 4"}{\text{Core Run or Interval Total Length}}\right) \times 100$$

$$\text{RQD}_{\text{(Example)}} = \left(\frac{25" + 33" + 20" + 12"}{120"}\right) \times 100 = 75\%$$

DESCRIPTORS

Arenaceous - Sandy

Argillaceous - Clayey

Brecciated - Contains angular gravel

Calcareous - Contains calcium carbonate

Carbonaceous - Contains carbon

Cherty - Contains chert

Conglomeritic - Contains rounded gravel

Crystalline - Contains crystalline structure

Dolomitic - Contains Ca/Mg carbonate

Ferriferous - Contains iron

Fissile - Thin planar partings

Fossiliferous - Contains fossils

Friable - Easily broken down

Micaceous - Contains mica

Pyritic - Contains pyrite

Siliceous - Contains silica

Stylolitic - Contains stylotites

Vuggy - Contains openings

DISCONTINUITIES IN BEDROCK

Fault	Fracture which expresses displacement parallel to the surface that does not result in a polished surface.
Joint	Planar fracture that does not express displacement. Generally occurs at regularly spaced intervals.
Shear	Fracture which expresses displacement parallel to the surface that results in polished surfaces or slickensides.
Bedding	A surface produced along a bedding plane.
Contact	A surface produced along a contact plane. (generally not seen in Ohio)

MODIFIED RMR DISCONTINUITY TERMS

DEGREE OF FRACTURING

Unfractured	>10 ft.
Intact	10 ft. – 3 ft.
Slightly Fractured	3 ft. – 1 ft.
Moderately Fractured	12 in. – 4 in.
Fractured	4 in. – 2 in.
Highly Fractured	< 2 in.

APERTURE WIDTH

Open	> 0.2 in.
Narrow	0.2 in. - 0.05 in.
Tight	< 0.05 in.

SURFACE ROUGHNESS

Very Rough	Near vertical steps and ridges occur on the discontinuity surface.
Slightly Rough	Asperities on the discontinuity surface are distinguishable and can be felt.
Slickensided	Surface has a smooth, glassy finish with visual evidence of striation.

GSI DISCONTINUITY TERMS

ROCK MASS STRUCTURE

Intact or Massive	Intact rock with few widely spaced discontinuities
Blocky	Well interlocked undisturbed rock mass, formed by 3 intersecting discontinuity sets
Very Blocky	Interlocked, partially disturbed mass formed by 4 or more joint sets
Blocky/ Disturbed/Seamy	Angular blocks formed by many intersecting discontinuity sets, bedding planes
Disintegrated	Poorly interlocked, heavily broken rock mass
Laminated/ Sheared	Lack of blockiness due to close spacing of weak shear planes

SURFACE CONDITION

Very Good	Very rough, fresh unweathered surfaces
Good	Rough, slightly weathered, iron stained surfaces
Fair	Smooth, moderately weathered and altered surfaces
Poor	Slickensided, high weathered surface with compact coatings
Very Poor	Slickensided, highly weathered surface with soft clay coatings

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 548+75, 82' LT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 979.4 (MSL) EOB: 15.0 ft.
START: 2/4/25 END: 2/4/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.176899 N, 80.555778 W

EXPLORATION ID **B-001-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 979.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 5 INCHES	979.0																		
Very stiff to hard brown **SILT AND CLAY**, trace to little fine to coarse sand, trace fine gravel, few sandstone fragments, damp.		1	4 8 9	26	100	SS-1	3.5-4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		2																	
		3																	
		4	11 13 15	42	100	SS-2	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		5																	
		6	5 7 10	26	100	SS-3	3.5-4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		7																	
		8	9 12 13	38	100	SS-4	3.5	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		9																	
		10	8 12 11	35	100	SS-5	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	966.4	11																	
Dense gray **SANDY SILT**, little clay, trace fine gravel, moist.		12 W 965.9																	
		13	10 14 12	39	100	SS-6	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
	964.4	14 EOB																	
		15																	

NOTES
- Encountered seepage at 13.5' during drilling.
- After removal of augers, borehole caved at 12' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:18 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 5

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 548+80, 35' LT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 979.6 (MSL) EOB: 15.0 ft.
START: 2/3/25 END: 2/3/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.176770 N, 80.555769 W

EXPLORATION ID **B-002-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 979.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT MILLINGS - 5 INCHES	979.2																		
FILL: Loose to medium dense brown **GRAVEL WITH SAND AND SILT**, little to some clay, damp. - From 1.5' to 2.3', concrete rubble	977.3	1	7	-	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	-	
Very stiff to hard gray **SILT AND CLAY**, trace to little fine to coarse sand, trace to little fine gravel, damp.	971.6	4	8 16 18	51	100	SS-2	3.0-4.0	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		7	13 21 16	56	100	SS-3	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
Dense gray **SANDY SILT**, little clay, trace fine gravel, damp.	969.1	9	11 18 22	60	100	SS-4	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
Hard gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	964.6	12	6 12 13	38	100	SS-5	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	EOB	15	11 18 18	54	100	SS-6	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 13.4' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:18 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 6

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 549+73, 36' RT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 977.9 (MSL) EOB: 15.0 ft.
START: 2/4/25 END: 2/4/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.176578 N, 80.555457 W

EXPLORATION ID **B-003-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT MILLINGS - 4 INCHES	977.6																		
Medium dense to dense brown **SANDY SILT**, little fine gravel, little clay, few sandstone fragments, damp.		1	5 6 11	26	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
		2																	
		3																	
		4	11 13 18	47	100	SS-2	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
	972.4	5																	
Hard gray **SILT AND CLAY**, little fine to coarse sand, little fine gravel, damp.		6																	
		7	13 15 19	51	100	SS-3	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		8																	
		9	11 16 17	50	100	SS-4	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		10																	
		11																	
		12	15 24 26	75	100	SS-5	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		13																	
	962.9	14	11 23 25	72	100	SS-6	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	EOB	15																	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 12.2' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 7

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 549+75, 66' RT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 978.0 (MSL) EOB: 15.0 ft.
START: 2/4/25 END: 2/4/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.176482 N, 80.555453 W

EXPLORATION ID **B-004-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 978.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	977.2																		
GRANULAR BASE - 3 INCHES	976.9																		
Dense to very dense brown **SANDY SILT**, little fine to coarse gravel, trace to little clay, damp.		1	7																
		2	10 12	33	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
		3																	
		4	11																
		5	16 24	60	100	SS-2	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
		6																	
		7	7 11 13	36	100	SS-3	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
	970.0	8																	
Dense gray **SANDY SILT**, little to some clay, little fine gravel, damp.		W 969.5																	
		9	9																
		10	11 16	41	100	SS-4	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
		11																	
		12	8 15 16	47	100	SS-5	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
		13																	
		14	10																
	963.0	EOB 15	11 12	35	100	SS-6	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	

NOTES
- Encountered seepage at 8.5' during drilling.
- After removal of augers, borehole caved at 13.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 8

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING
TYPE: UTILITY
PID: 121698 BR ID: N/A
START: 2/3/25 END: 2/3/25

DRILLING FIRM / OPERATOR: OTB / C. SVITAK
SAMPLING FIRM / LOGGER: S&ME / K. HARPER
DRILLING METHOD: 3-1/4" HSA
SAMPLING METHOD: SPT

DRILL RIG: OTB MOBILE B-57
HAMMER: SAFETY HAMMER
CALIBRATION DATE: 12/30/24
ENERGY RATIO (%): 90*

STATION / OFFSET: 559+38, 37' LT
ALIGNMENT: IR 80 CL
ELEVATION: 950.5 (MSL) EOB: 10.0 ft.
LAT / LONG: 41.176821 N, 80.551826 W

EXPLORATION ID
B-005-0-25

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 950.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT MILLINGS - 6 INCHES	950.0																		
GRANULAR BASE - 6 INCHES	949.5																		
Hard brown and gray **SILT AND CLAY**, little to some fine to coarse sand, trace to little fine gravel, few reddish-orange sandstone fragments below 5.5', damp.		1	5 7 9	24	100	SS-1	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		2																	
		3																	
		4	6 7 17	36	100	SS-2	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		5																	
		6	12 16 21	56	100	SS-3	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	942.0	7																	
		8																	
Very stiff gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	940.5	9	6 6 8	21	100	SS-4	3.0	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
EOB		10																	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 7.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 9

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 569+70, 37' LT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 921.4 (MSL) EOB: 10.0 ft.
START: 2/3/25 END: 2/3/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.176857 N, 80.548187 W

EXPLORATION ID **B-006-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 921.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT MILLINGS - 7 INCHES	920.8																		
FILL: Medium dense brown **GRAVEL WITH SAND AND SILT**, trace clay, damp.	918.4	1	3 5 5	15	100	SS-1	-	-	-	-	-	-	-	-	-	-	A-2-4 (V)	-	
Hard gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	913.4	2 3 4 5 6 7	10 15 22	56	100	SS-2	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
			8 18 23	62	100	SS-3	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
Very dense gray **SILT**, little clay, little fine to coarse sand, trace to little fine gravel, few sandstone fragments, damp.	911.4	8 9 EOB 10	25 31 26	86	100	SS-4	-	-	-	-	-	-	-	-	-	-	A-4b (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 7.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 10

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING
TYPE: UTILITY
PID: 121698 BR ID: N/A
START: 2/3/25 END: 2/3/25

DRILLING FIRM / OPERATOR: OTB / C. SVITAK
SAMPLING FIRM / LOGGER: S&ME / K. HARPER
DRILLING METHOD: 3-1/4" HSA
SAMPLING METHOD: SPT

DRILL RIG: OTB MOBILE B-57
HAMMER: SAFETY HAMMER
CALIBRATION DATE: 12/30/24
ENERGY RATIO (%): 90*

STATION / OFFSET: 593+28, 37' LT
ALIGNMENT: IR 80 CL
ELEVATION: 974.5 (MSL) EOB: 10.0 ft.
LAT / LONG: 41.176949 N, 80.539624 W

EXPLORATION ID
B-009-0-25

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 974.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 3 INCHES	974.2																		
GRANULAR BASE (WITH SLAG) - 15 INCHES	973.0																		
Very stiff brown **SILTY CLAY**, little fine to coarse sand, trace fine gravel, damp.	971.5	1																	
		2	4 5 7	18	100	SS-1	3.0-4.0	-	-	-	-	-	-	-	-	-	A-6b (V)	-	
Hard gray-brownish **SILT AND CLAY**, little fine to coarse sand, little fine gravel, damp.	969.0	3																	
		4	3 11 11	33	100	SS-2	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
Very stiff to hard brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	964.5	5																	
		6																	
		7	3 5 5	15	100	SS-3	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		8																	
		9	3 3 5	12	100	SS-4	3.0-4.0	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	EOB	10																	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 8.9' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 11

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING
TYPE: UTILITY
PID: 121698 BR ID: N/A
START: 2/3/25 END: 2/3/25

DRILLING FIRM / OPERATOR: OTB / C. SVITAK
SAMPLING FIRM / LOGGER: S&ME / K. HARPER
DRILLING METHOD: 3-1/4" HSA
SAMPLING METHOD: SPT

DRILL RIG: OTB MOBILE B-57
HAMMER: SAFETY HAMMER
CALIBRATION DATE: 12/30/24
ENERGY RATIO (%): 90*

STATION / OFFSET: 603+22, 38' LT
ALIGNMENT: IR 80 CL
ELEVATION: 1003.9 (MSL) EOB: 10.0 ft.
LAT / LONG: 41.177338 N, 80.536078 W

EXPLORATION ID **B-010-0-25**
PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1003.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 3 INCHES	1003.6																		
GRANULAR BASE - 15 INCHES	1002.4																		
Very stiff to hard brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.		1	3 4 4	12	100	SS-1	3.5-4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		2																	
		3																	
		4	3 3 7	15	100	SS-2	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		5																	
		6	9 15 20	53	100	SS-3A	4.5+	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	996.8					SS-3B	-	-	-	-	-	-	-	-	-	-	A-1-b (V)	-	
Very dense light brown **GRAVEL WITH SAND**, trace silt, trace clay, damp.	995.9	7																	
		8																	
Very stiff brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.		9	3 5 5	15	100	SS-4	2.5-3.5	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
	993.9	EOB 10																	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 8.6' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 12

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 606+37, 118' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1009.4 (MSL) EOB: 7.5 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.177761 N, 80.535045 W

EXPLORATION ID **B-010-1-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1009.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 12 INCHES	1008.4																		
GRANULAR BASE - 5 INCHES	1008.0																		
FILL: Hard brown and black **SANDY SILT**, "and" fine to coarse gravel, some clay, damp.	1006.4	1 2 3 4 5 6 7	3 7 9	24	100	SS-1	4.2-4.5+	37	10	6	23	24	33	23	10	10	A-4a (2)	540	
Very stiff brown **SILT AND CLAY**, some fine to coarse sand, trace fine gravel, damp.	1004.9		4 3 3	9	100	SS-2	2.5-3.5	6	8	15	38	33	37	22	15	19	A-6a (9)	-	
Hard brown and gray **SILT AND CLAY**, little to some fine to coarse sand, trace fine gravel, damp.	1001.9		4 6 7	20	100	SS-3	4.5+	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		EOB	4 7 8	23	100	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 13

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 607+27, 39' LT
TYPE: UTILITY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1013.9 (MSL) EOB: 9.8 ft.
START: 2/3/25 END: 2/3/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.177662 N, 80.534699 W

EXPLORATION ID **B-011-0-25**

MATERIAL DESCRIPTION AND NOTES	ELEV. 1013.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	1013.1																		
GRANULAR BASE (WITH SLAG) - 15 INCHES	1011.9																		
Very stiff brown **SILT AND CLAY**, little to some fine to coarse sand, trace fine gravel, damp.		1	5 5 4	14	100	SS-1A	2.0	-	-	-	-	-	-	-	-	-	A-1-b (V)	-	
						SS-1B	3.5	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		2																	
		3																	
		4	3 3 4	11	61	SS-2	3.0	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
		5																	
	1007.3	6																	
SHALE, gray, severely weathered, very weak.		TR 7	3 13 17	45	100	SS-3A	3.5	-	-	-	-	-	-	-	-	-	A-6a (V)	-	
						SS-3B	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
		8																	
	1004.1	9 EOB	17 25 50/3"	-	100	SS-4	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 7.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 14

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 610+49, 168' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1019.1 (MSL) EOB: 7.0 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.178292 N, 80.533775 W

EXPLORATION ID **B-011-1-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1019.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1018.2																		
GRANULAR BASE (WITH SLAG) - 7 INCHES	1017.6																		
Hard brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, few shale fragments, similar to severely weathered shale, damp.	1016.6		9 6 12	27	100	SS-1A	-	-	-	-	-	-	-	-	-	-	A-1-b (V)	-	
						SS-1B	4.5+	2	4	10	53	31	31	19	12	13	A-6a (9)	53	
		TR	16 38 50	132	100	SS-2	-	-	-	-	-	-	-	-	-	9	Rock (V)	-	
SHALE, gray, severely weathered, very weak.		4	28 50/4"	-	100	SS-3	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
		5																	
	1012.1	6 EOB 7	14 19 39	87	100	SS-4	-	-	-	-	-	-	-	-	-	10	Rock (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 15

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB ATV D50	STATION / OFFSET: 610+37, 262' LT
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1018.0 (MSL) EOB: 13.6 ft.
START: 2/7/25 END: 2/7/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 74.3	LAT / LONG: 41.178551 N, 80.533986 W

EXPLORATION ID **B-014-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1018.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 12 INCHES	1017.0																		
POSSIBLE FILL: Stiff to very stiff brown **SILTY CLAY**, trace fine to coarse sand, trace fine gravel, damp.	1015.0	1	2 2 5	9	100	SS-1	1.5-2.5	2	2	8	46	42	38	20	18	22	A-6b (11)	53	
Hard brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	1012.5	2 3 4 5	7 11 13	30	100	SS-2	4.5+	8	8	8	39	37	33	22	11	17	A-6a (8)	-	
SHALE, gray, highly to severely weathered, very weak.		TR 6 7 8 9 10 11	11 19 32	63	100	SS-3	-	-	-	-	-	-	-	-	-	12	Rock (V)	-	
	1005.5		35 50/5"	-	100	SS-4	-	-	-	-	-	-	-	-	-	10	Rock (V)	-	
SHALE, gray, highly weathered, weak.	1004.4	12	39 50/5"	-	100	SS-5	-	-	-	-	-	-	-	-	-	7	Rock (V)	-	
		EOB 13	50/1"	-	100	SS-6	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No water encountered during drilling.
- Auger refusal at 13.6'.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 16

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB ATV D50	STATION / OFFSET: 610+76, 385' LT
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1014.7 (MSL) EOB: 19.0 ft.
START: 2/7/25 END: 2/7/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 74.3	LAT / LONG: 41.178871 N, 80.534024 W

EXPLORATION ID **B-015-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1014.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 11 INCHES	1013.8																		
Stiff to very stiff brown **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, moist.	1009.2		2 2 3	6	100	SS-1	1.0-2.0	2	3	8	62	25	33	21	12	27	A-6a (9)	40	
			3 6 8	17	100	SS-2	3.5	-	-	-	-	-	-	-	-	25	A-6a (V)	-	
Very stiff to hard brown and reddish-brown **SANDY SILT**, some clay, little fine to coarse gravel, many shale fragments, becoming similar to severely weathered shale, damp.	1004.2		3 6 9	19	100	SS-3	2.5	20	16	9	34	21	32	22	10	19	A-4a (4)	-	
			8 13 19	40	100	SS-4	-	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
SHALE, gray, highly to severely weathered, very weak to weak.		TR	35 50/4"	-	100	SS-5	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
			36 50/5"	-	100	SS-6	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
			34 32 31	78	100	SS-7	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
	995.7	EOB	50/1"	-	100	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No water encountered during drilling.
- Auger refusal at 19.0'.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 17

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB ATV D50	STATION / OFFSET: 612+38, 415' LT
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1018.2 (MSL) EOB: 18.6 ft.
START: 2/6/25 END: 2/7/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 74.3	LAT / LONG: 41.179130 N, 80.533591 W

EXPLORATION ID **B-016-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1018.2	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 9 INCHES	1017.4																		
Very stiff to hard brown and reddish-brown **SILT AND CLAY**, trace fine to coarse sand, trace fine to coarse gravel, few shale fragments, damp.	1015.2		3 4 5	11	100	SS-1	3.5-4.2	8	2	8	56	26	31	20	11	20	A-6a (8)	173	
Very stiff to hard brown and gray **CLAY**, some silt, some fine to coarse sand, few shale fragments, damp.	1012.7		4 8 8	20	100	SS-2	3.5-4.5	0	11	10	34	45	41	24	17	21	A-7-6 (11)	-	
Medium dense brown and gray **SANDY SILT**, some clay, little fine to coarse gravel, becoming similar to severely weathered shale, damp.	1010.2		9 7 9	20	100	SS-3	-	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
SHALE, gray, highly to severely weathered, very weak to weak.		TR	18 35 50	105	100	SS-4	-	-	-	-	-	-	-	-	-	10	Rock (V)	-	
			36 50/5"	-	100	SS-5	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
		W 1002.2	26 38 50/5"	-	100	SS-6	-	-	-	-	-	-	-	-	-	11	Rock (V)	-	
			36 50/4"	-	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
	999.6	EOB	50/1"	-	100	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No seepage encountered during drilling on 2/6/25.
- Prior to commencing drilling on 2/7/25, water had accumulated in bore hole to a depth of 4.0' inside the augers.
- Encountered seepage at 16.0' during drilling on 2/7/25.
- After removal of augers, borehole did not cave and water was measured at 17.4'.

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

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PLATE 18

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB ATV D50	STATION / OFFSET: 614+86, 326' LT
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1027.7 (MSL) EOB: 23.8 ft.
START: 2/6/25 END: 2/6/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 74.3	LAT / LONG: 41.179252 N, 80.532705 W

EXPLORATION ID **B-017-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1027.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ROOTMAT - 10 INCHES	1026.9																		
Stiff brown with gray **SILT AND CLAY**, trace fine to coarse sand, trace fine gravel, few shale fragments, moist.	1024.7		3 4 5	11	100	SS-1	1.5-2.0	0	4	6	64	26	32	21	11	23	A-6a (8)	53	
Very stiff to hard brown with gray **SANDY SILT**, some clay, trace fine gravel, few shale fragments, damp.	1022.2		9 11 13	30	100	SS-2	3.0-4.5+	7	7	8	46	32	29	20	9	13	A-4a (8)	-	
SHALE, gray, severely weathered, very weak, similar to hard soil.	1016.5	TR	13 18 22	50	100	SS-3	-	-	-	-	-	-	-	-	-	10	Rock (V)	-	
			5 13 15	35	100	SS-4	-	-	-	-	-	-	-	-	-	10	Rock (V)	-	
SANDSTONE, gray, highly weathered, weak.	1015.7		50/3"	-	100	SS-5A	-	-	-	-	-	-	-	-	-	9	Rock (V)	-	
						SS-5B	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
SHALE, gray, highly weathered, weak.			50/4"	-	100	SS-6	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
			50/4"	-	100	SS-7	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
			50/3"	-	100	SS-8	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
			50/3"	-	100	SS-9	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
	1003.9	EOB	50/3"	-	100	SS-10	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 19

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 614+60, 180' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1026.9 (MSL) EOB: 5.9 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.178836 N, 80.532520 W

EXPLORATION ID **B-018-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1026.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 3 INCHES	1026.6																		
REINFORCED CONCRETE - 8 INCHES	1026.0	W 1025.9																	
GRANULAR BASE - 5 INCHES	1025.6	TR																	
SHALE, dark gray, highly to severely weathered, very weak to weak.		1	4 7 23	45	100	SS-1A	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	-	
		2				SS-1B	-	-	-	-	-	-	-	-	-	12	Rock (V)	-	
		3	13 23 32	83	100	SS-2	-	-	-	-	-	-	-	-	-	9	Rock (V)	-	
		4	26 50/4"	-	100	SS-3	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	
	1021.0	EOB 5	50/5"	-	100	SS-4	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- Encountered seepage at 1.0' during drilling.
- After removal of augers, borehole caved at 4.5' and was "dry".
- 1/4" diameter (#4 bar) reinforcing steel observed in concrete.

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 20

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 618+79, 165' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1025.8 (MSL) EOB: 5.2 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.179372 N, 80.531267 W

EXPLORATION ID **B-019-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1025.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 11 INCHES	1024.9																		
GRANULAR BASE - 7 INCHES	1024.3																		
Very stiff dark brown and gray **SILT**, some clay, little fine to coarse sand, trace fine to coarse gravel, slight organic odor, few shale fragments, moist.	1023.3	TR	2 3 40	65	100	SS-1A	2.5	8	3	10	56	23	25	21	4	20	A-4b (8)	40	
						SS-1B	-	-	-	-	-	-	-	-	-	5	Rock (V)	-	
SHALE, dark gray, highly weathered, very weak to weak.			49 50/3"	-	100	SS-2	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	
	1020.6	EOB	22 50/2"	-	100	SS-3	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	

NOTES
- No water encountered during drilling.
- Auger refusal at 5.2'.
- After removal of augers, borehole did not cave and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 21

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 622+81, 99' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1018.7 (MSL) EOB: 6.4 ft.
START: 2/4/25 END: 2/4/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.179878 N, 80.529978 W

EXPLORATION ID **B-020-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1018.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	1018.0																		
REINFORCED CONCRETE - 7 INCHES	1017.5																		
GRANULAR BASE - 3 INCHES	1017.2																		
Very stiff brown and gray **SANDY SILT**, some clay, some fine to coarse gravel, few shale fragments, damp.	1015.7	TR	3 3 7	15	100	SS-1	3.0-3.5	22	4	5	40	29	29	21	8	13	A-4a (7)	73	
			50/5"	-	100	SS-2	-	-	-	-	-	-	-	-	-	4	Rock (V)	-	
SHALE, gray, highly weathered, very weak to weak.			35 50/3"	-	100	SS-3	-	-	-	-	-	-	-	-	-	4	Rock (V)	-	
	1012.3	EOB	50/5"	-	100	SS-4	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole did not cave and was "dry".
- 1/4" diameter (#4 bar) reinforcing steel observed in concrete.

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINT\WPROJECTS\23170065D TRU-80.GPJ

PLATE 22

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 626+87, 87' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1010.9 (MSL) EOB: 6.8 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.180526 N, 80.528789 W

EXPLORATION ID **B-021-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1010.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 18 INCHES	1009.4																		
GRANULAR BASE - 6 INCHES	1008.9																		
Hard brown **SANDY SILT**, little clay, little fine gravel, damp.	1007.9		5 7 6	20	100	SS-1A	4.5+	15	9	16	40	20	25	17	8	12	A-4a (5)	220	
	1007.4	TR				SS-1B	4.5+	39	2	3	34	22	30	18	12	10	A-6a (5)	-	
Hard gray **SILT AND CLAY**, "and" fine to coarse gravel (shale fragments), trace fine to coarse sand, damp.			28 50/5"	-	100	SS-2	-	-	-	-	-	-	-	-	-	5	Rock (V)	-	
SHALE, gray, highly weathered, very weak to weak.			50/3"	-	100	SS-3	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	
	1004.1	W 1004.4 EOB	50/4"	-	100	SS-4	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES
- Encountered seepage at 6.5' during drilling.
- After removal of augers, borehole caved at 6.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTWPROJECTS\23170065D TRU-80.GPJ

PLATE 23

S&ME JOB: 23170065D

PROJECT: TRU-80-11.32 TRUCK PARKING	DRILLING FIRM / OPERATOR: OTB / C. SVITAK	DRILL RIG: OTB MOBILE B-57	STATION / OFFSET: 630+64, 86' LT
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: SAFETY HAMMER	ALIGNMENT: IR 80 CL
PID: 121698 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1000.6 (MSL) EOB: 6.9 ft.
START: 2/5/25 END: 2/5/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.181199 N, 80.527645 W

EXPLORATION ID **B-022-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1000.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	999.8	1																	
GRANULAR BASE - 9 INCHES	999.1																		
Hard light brown **SILT**, some clay, trace to coarse fine gravel, trace fine to coarse sand, few shale fragments, dry to damp.	997.6	2	7 17 19	54	100	SS-1	-	9	3	4	59	25	27	19	8	8	A-4b (8)	40	
Hard light brown **SANDY SILT**, "and" fine to coarse gravel (shale fragments), little clay, similar to severely weathered shale, dry to damp.	996.1	3 4	15 25 25	75	100	SS-2	-	43	3	3	34	17	28	21	7	6	A-4a (3)	-	
		TR 5	20 28 36	96	100	SS-3	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
SHALE, gray, highly to severely weathered, very weak, few sandstone seams.	993.7	6 EOB	26 50/5"	-	100	SS-4	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	

NOTES
- No water encountered during drilling.
- After removal of augers, borehole caved at 5.5' and was "dry".

NOTES: SEE ABOVE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: ASPHALT PATCH; PLASTIC HOLE PLUG DEVICE; SOIL CUTTINGS MIXED WITH BENTONITE

S&ME ODOT SULFATE (8.5X11) - SGE 01/2019 - OH DOT.GDT - 7/8/25 11:19 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065D TRU-80.GPJ

PLATE 24

OHIO DEPARTMENT OF TRANSPORTATION

DETERMINING SULFATE CONTENT IN SOILS
SUPPLEMENT 1122

Project C-R-S: TRU-80-11.35 Truck Parking

PID No: 121698

Report Date: 2/26/2025

Consultant: S&ME, Inc

Technician: M. Bolton/R. Sena

Sample or Boring ID	Station (IR 80 CL)	Offset	Ohio County Coordinate System Coordinates		Elevation (Top of Sample)	Soaking Time (hr)	Replicate Sample Readings						Sulfate Content (ppm)
							1		2		3		
							Dilution	Reading	Dilution	Reading	Dilution	Reading	
B-010-1-25	606+37	118' LT	465699.2642	250742.6717	1008	16	20	25	20	28	20	28	540
B-011-1-25	610+49	168' LT	465891.4291	251095.5195	1017.6	16	20	4	20	2	20	2	53
B-014-0-25	610+37	262' LT	465973.2129	251047.2215	1017	16	20	2	20	4	20	2	53
B-015-0-25	610+76	385' LT	466099.7457	251030.0261	1013.7	16	20	<2	20	<2	20	<2	<40
B-016-0-25	612+38	415' LT	466190.6312	251150.0531	1017.2	16	20	7	20	6	20	13	173
B-017-0-25	614+86	326' LT	466219.084	251392.8375	1026.7	16	20	3	20	3	20	2	53
B-019-0-25	618+79	165' LT	466279.7708	251793.3141	1024.3	16	20	<2	20	<2	20	<2	<40
B-020-0-25	622+81	99' LT	466463.5605	252146.52	1017.2	16	20	4	20	3	20	4	73
B-021-0-25	626+87	87' LT	466705.6067	252472.8225	1008.9	16	20	11	20	11	20	11	220
B-022-0-25	630+64	86' LT	466938.6873	252769.0043	999.1	16	20	<2	20	<2	20	<2	<40

Important Information About Your
Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project.

Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

Appendix II

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Design Manual Section 600

TRU-80-11.32 Truck Parking
121698

PROJECT DESCRIPTION - Truck parking area in vacant rest area, including deceleration ramp.

S&ME, Inc.

Prepared By: Brian K. Sears, PE
Date prepared: Thursday, March 27, 2025

Brian K. Sears
6190 Enterprise Court
Dublin, OH 43016

(614) 793-2226
bsears@smeinc.com

NO. OF BORINGS: 11

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.7 11/6/2024

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-010-1-25	IR 80	606+37	118	LT	Mobile B-57 Truck	90	1009.4	1007.3	2.1 C
2	B-011-1-25	IR 80	610+49	168	LT	Mobile B-57 Truck	90	1019.1	1016.5	2.6 C
3	B-014-0-25	IR 80	610+37	262	LT	D50 ATV	74	1018.0	1015.7	2.3 C
4	B-015-0-25	IR 80	610+76	385	LT	D50 ATV	74	1014.7	1015.1	0.4 F
5	B-016-0-25	IR 80	612+38	415	LT	D50 ATV	74	1018.2	1017.9	0.3 C
6	B-017-0-25	IR 80	614+86	326	LT	D50 ATV	74	1027.7	1024.0	3.7 C
7	B-018-0-25	IR 80	614+60	180	LT	Mobile B-57 Truck	90	1026.9	1024.7	2.2 C
8	B-019-0-25	IR 80	618+79	165	LT	Mobile B-57 Truck	90	1025.8	1023.8	2.0 C
9	B-020-0-25	IR 80	622+81	99	LT	Mobile B-57 Truck	90	1018.7	1016.8	1.9 C
10	B-021-0-25	IR 80	626+87	87	LT	Mobile B-57 Truck	90	1010.9	1008.1	2.8 C
11	B-022-0-25	IR 80	630+64	86	LT	Mobile B-57 Truck	90	1000.6	998.1	2.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.7 11/6/2024

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	-0.6	0.9	24		4.2	33	23	10	23	24	47	10	18	A-4a	2	540					12" Exc. & Replace
	010-1	SS-2	3.0	4.5	0.9	2.4	9		3	37	22	15	38	33	71	19	17	A-6a	9			N_{60}		12"	
	25	SS-3	4.5	6.0	2.4	3.9	20		4.5								14	A-6a	10						
		SS-4	6.0	7.5	3.9	5.4	23	9	4.5								14	A-6a	10						
2	B	SS-1B	1.5	2.5	-1.1	-0.1	27		4.5	31	19	12	53	31	84	13	14	A-6a	9	53					6" Rock Exc.
	011-1	SS-2	2.5	4.0	-0.1	1.4	132									9	0	Rock	0		Rock		6"		
	25	SS-3	4.0	4.8	1.4	2.2	100									8	0	Rock	0						
		SS-4	5.5	7.0	2.9	4.4	87	30								10	0	Rock	0						
3	B	SS-1	1.0	2.5	-1.3	0.2	9		2	38	20	18	46	42	88	22	16	A-6b	11	53		N_{60} & Mc		12"	12" Exc. & Replace
	014-0	SS-2	3.5	5.0	1.2	2.7	30		4.5	33	22	11	39	37	76	17	17	A-6a	8						
	25	SS-3	6.0	7.5	3.7	5.2	63									12	0	Rock	0						
		SS-4	8.5	9.4	6.2	7.1	100	9								10	0	Rock							
4	B	SS-1	1.0	2.5	1.4	2.9	6		1.5	33	21	12	62	25	87	27	16	A-6a	9	40		HP & Mc			
	015-0	SS-2	3.5	5.0	3.9	5.4	17		3.5								14	A-6a	10						
	25	SS-3	6.0	7.5	6.4	7.9	19		2.5	32	22	10	34	21	55	19	17	A-4a							
		SS-4	8.5	10.0	8.9	10.4	40	6									10	A-4a							
5	B	SS-1	1.0	2.5	0.7	2.2	11		3.7	31	20	11	56	26	82	20	15	A-6a	8	173		N_{60} & Mc		12"	12" Exc. & Replace
	016-0	SS-2	3.5	5.0	3.2	4.7	20		4	41	24	17	34	45	79	21	21	A-7-6	11						
	25	SS-3	6.0	7.5	5.7	7.2	20									18	10	A-4a							
		SS-4	8.5	10.0	8.2	9.7	105	11								10	0	Rock							
6	B	SS-1	1.0	2.5	-2.7	-1.2	11		1.7	32	21	11	64	26	90	23	16	A-6a	8	53					
	017-0	SS-2	3.5	5.0	-0.2	1.3	30		3.5	29	20	9	46	32	78	13	15	A-4a	8						
	25	SS-3	6.0	7.5	2.3	3.8	50									10	0	Rock	0						
		SS-4	8.5	10.0	4.8	6.3	35	30								10	0	Rock	0						
7	B	SS-1A	1.0	1.3	-1.2	-0.9	45									14	6	A-1-b	0						6" Rock Exc.
	018-0	SS-1B/2	1.3	4.0	-0.9	1.8	83									12	0	Rock	0		Rock		6"		
	25	SS-3	4.0	4.8	1.8	2.6	100									6	0	Rock	0						
		SS-4	5.5	5.9	3.3	3.7	100	30									0	Rock	0						
8	B	SS-1A	1.5	2.5	-0.5	0.5	65		2.5	25	21	4	56	23	79	20	16	A-4b	8	40	A-4b	Mc			6" Exc. & Replace
	019-0	SS-1B/2	2.5	3.8	0.5	1.8	100									5	0	Rock	0		Rock				
	25	SS-3	4.5	5.2	2.5	3.2	100									6	0	Rock	0						
								30																	
9	B	SS-1	1.5	3.0	-0.4	1.1	15		3.2	29	21	8	40	29	69	13	16	A-4a	7	73					
	020-0	SS-2	3.0	3.4	1.1	1.5	100									4	0	Rock	0						
	25	SS-3	4.5	5.3	2.6	3.4	100									4	0	Rock	0						
		SS-4	6.0	6.4	4.1	4.5	100	15									0	Rock	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.7 11/6/2024

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
10	B	SS-1A	2.0	3.0	-0.8	0.2	20		4.5	25	17	8	40	20	60	12	12	A-4a	5	220					
	021-0	SS-1B	3.0	3.5	0.2	0.7	20		4.5	30	18	12	34	22	56	10	14	A-6a	5						
	25	SS-2	3.5	4.4	0.7	1.6	100									5	0	Rock	0						
		SS-3	5.0	5.3	2.2	2.5	100	20									0	Rock	0						
11	B	SS-1	1.5	3.0	-1.0	0.5	54			27	19	8	59	25	84	8	14	A-4b	8	40	A-4b		6"		6" Exc. & Replace
	022-0	SS-2	3.0	4.5	0.5	2.0	75			28	21	7	34	17	51	6	16	A-4a	3						
	25	SS-3	4.5	6.0	2.0	3.5	96									8	0	Rock	0						
		SS-4	6.0	6.9	3.5	4.4	100	30								6	0	Rock	0						

PID: 121698

County-Route-Section: TRU-80-11.32 Truck Parking

No. of Borings: 11

Geotechnical Consultant: S&ME, Inc.

Prepared By: Brian K. Sears, PE

Date prepared: 3/27/2025

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	NA

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L):	0"
Average(HP):	0"
Global Geogrid Average(N60L):	0"
Average(HP):	0"

Design CBR	9

% Samples within 3 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	0%
$N_{60} < 12$	11%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	0%	1 < HP ≤ 2	6%
$N_{60} \geq 20$	61%	HP > 2	28%
M+	11%		
Rock	41%		
Unsuitable Soil	200%		

Excavate and Replace at Surface	
Average	0"
Maximum	0"
Minimum	0"

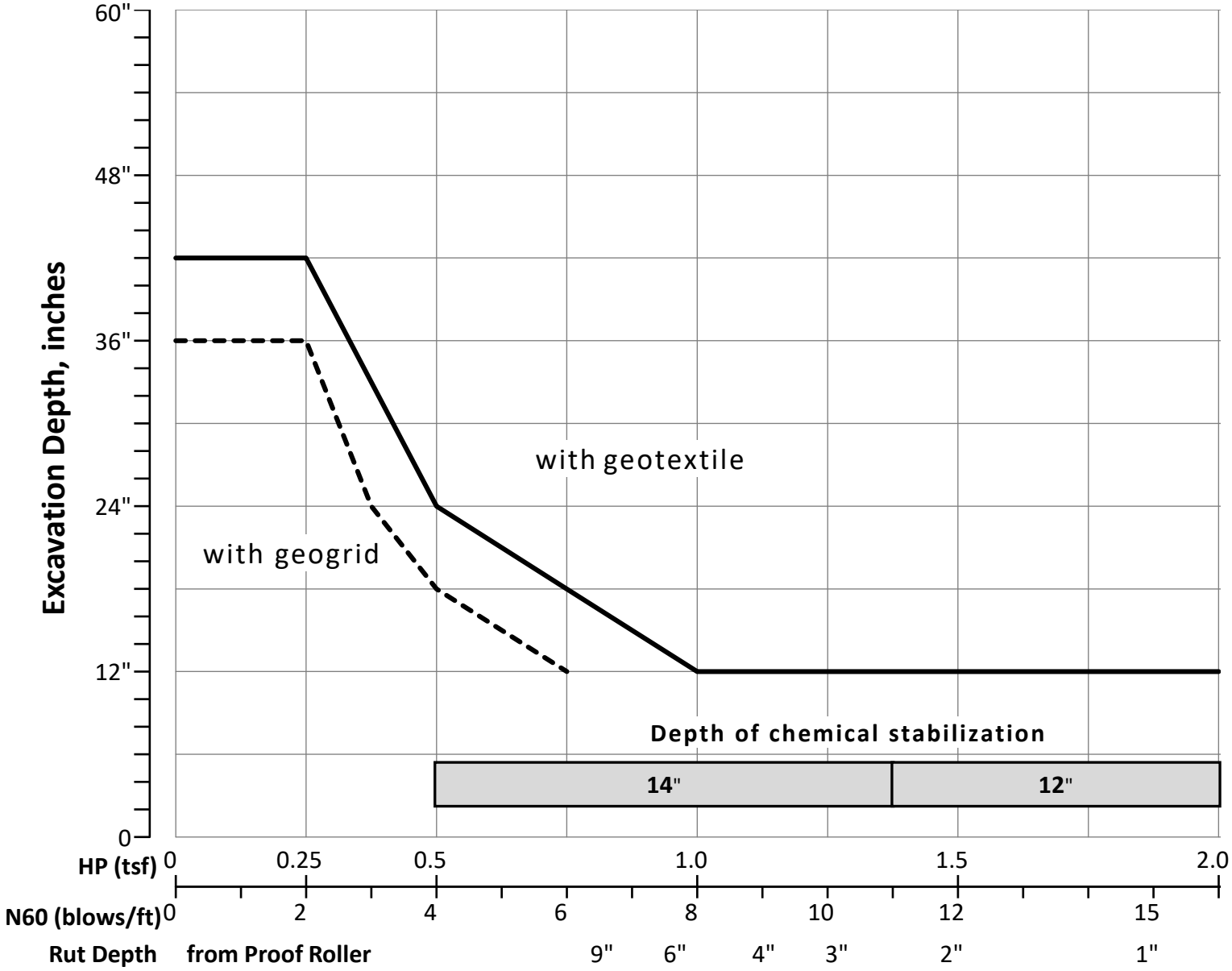
% Proposed Subgrade Surface	
Unstable & Unsuitable	34%
Unstable	17%
Unsuitable (Soil & Rock)	17%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	59	20	3.51	31	21	11	43	28	71	12	8	4
Maximum	132	30	4.50	41	24	18	64	45	90	27	21	11
Minimum	6	6	1.50	25	17	4	23	17	47	4	0	0

Classification Counts by Sample

ODOT Class	UCF	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	20	0	0	0	0	0	0	0	0	8	2	0	8	1	0	1	0	0	40
Percent	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	20%	5%	0%	20%	3%	0%	3%	0%	0%	100%
% Rock|Granular|Cohesive	0%	50%	20%									30%								100%
Surface Class Count	0	12	0	1	0	0	0	0	0	0	5	2	0	8	1	0	0	0	0	29
Surface Class Percent	0%	41%	0%	3%	0%	0%	0%	0%	0%	0%	17%	7%	0%	28%	3%	0%	0%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.51		☐ HP
20.00		☐ N60L

Average HP
Average N_{60L}

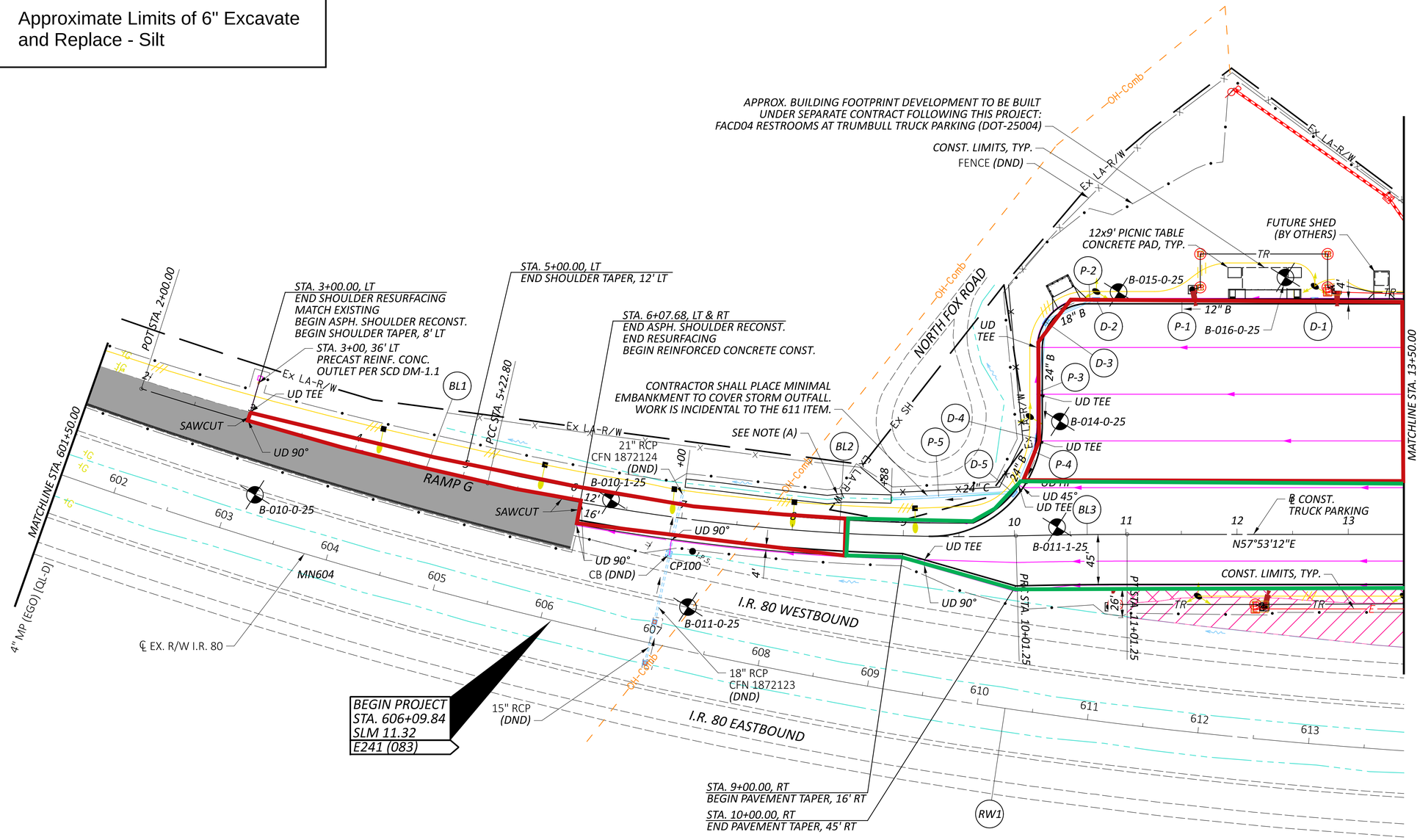
PLATE 6

FOR NOTES AND LEGEND, SEE SHEET P.13
(A) ITEM 836 - SEEDING AND EROSION CONTROL WITH TURF REINFORCING MAT, TYPE 1 (188' L x 7.5' W)

CONCEPTUAL DELINEATION OF ESTIMATED AREAS FOR "EXCAVATE AND REPLACE" SUBGRADE REMEDIATION

LEGEND

- Approximate Limits of 12" Excavate and Replace - Unstable Soil
- Approximate Limits of 6" Excavate and Replace - Bedrock
- Approximate Limits of 6" Excavate and Replace - Silt



HORIZONTAL SCALE IN FEET
0 25 50 100

I.R. 80 TRUCK PARKING - PLAN SHEET
STA. 601+50 TO STA. 13+50

TRU-80-11.32 TRUCK PARKING

MODEL: GP001 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/10/2025 TIME: 10:30:20 AM USER: mphilip1
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 04\Trumbull\121698\400-Engineering\Roadway\Sheets\121698_GP000.dgn

DESIGN AGENCY

DESIGNER MEP
REVIEWER LMB 7/3/25
PROJECT ID 121698
SHEET P.14 TOTAL 61

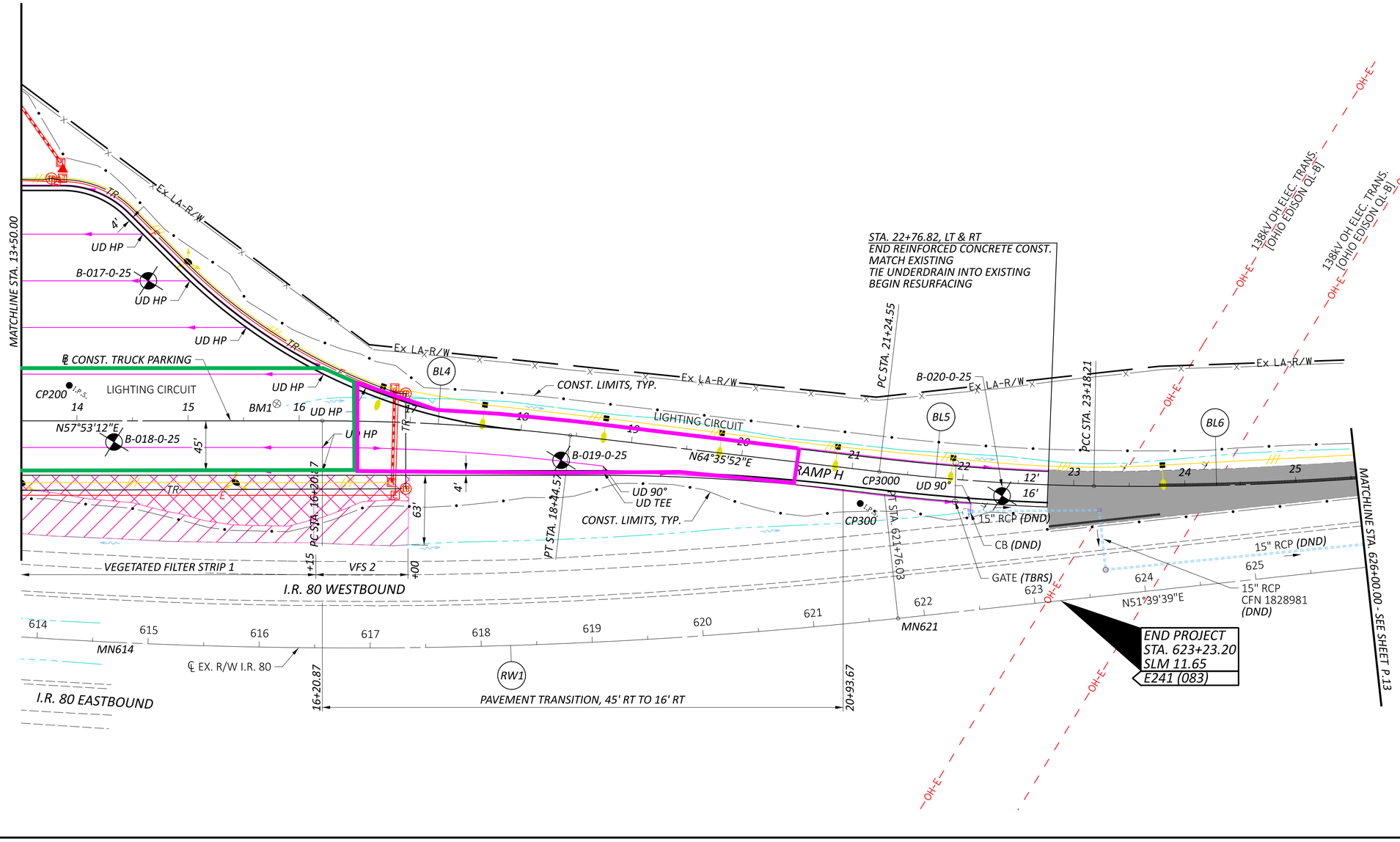
PLATE 7

FOR NOTES AND LEGEND, SEE SHEET P.13

CONCEPTUAL DELINEATION OF ESTIMATED AREAS FOR "EXCAVATE AND REPLACE" SUBGRADE REMEDIATION

LEGEND

- Approximate Limits of 12" Excavate and Replace - Unstable Soil
- Approximate Limits of 6" Excavate and Replace - Bedrock
- Approximate Limits of 6" Excavate and Replace - Silt



HORIZONTAL SCALE IN FEET
0 25 50 100

PLATE 8

I.R. 80 TRUCK PARKING - PLAN SHEET
STA. 13+50 TO STA. 626+00

DESIGN AGENCY

DESIGNER MEP
REVIEWER LMB 7/3/25
PROJECT ID 121698
SHEET P.15 TOTAL 61

TRU-80-11.32 TRUCK PARKING

MODEL: GP002 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/10/2025 TIME: 10:30:21 AM USER: mphilip1
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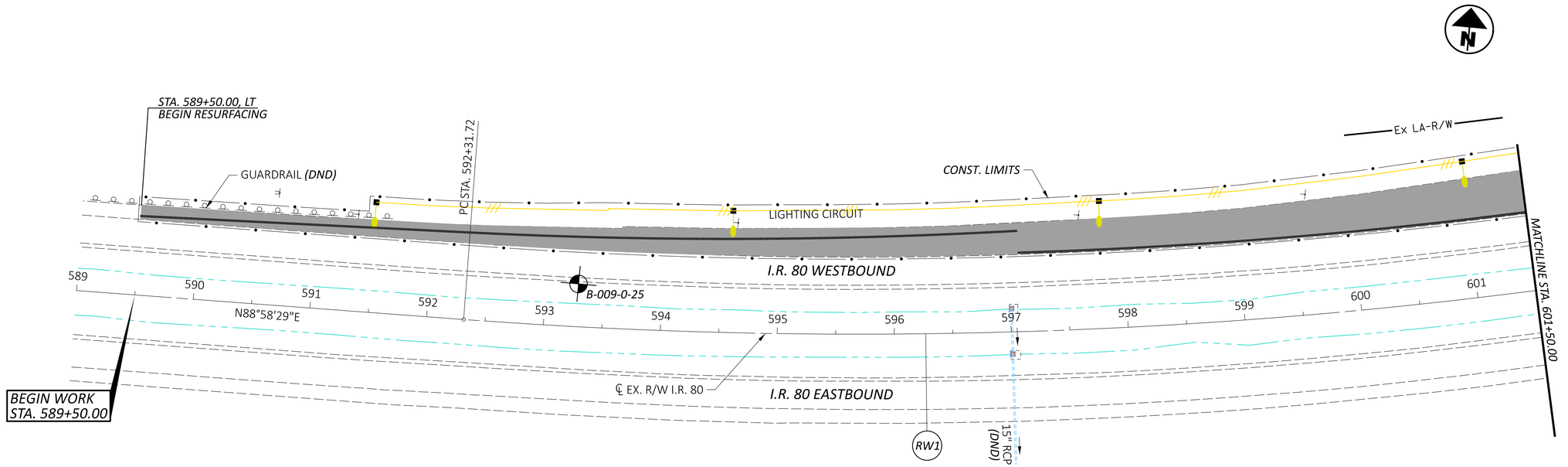

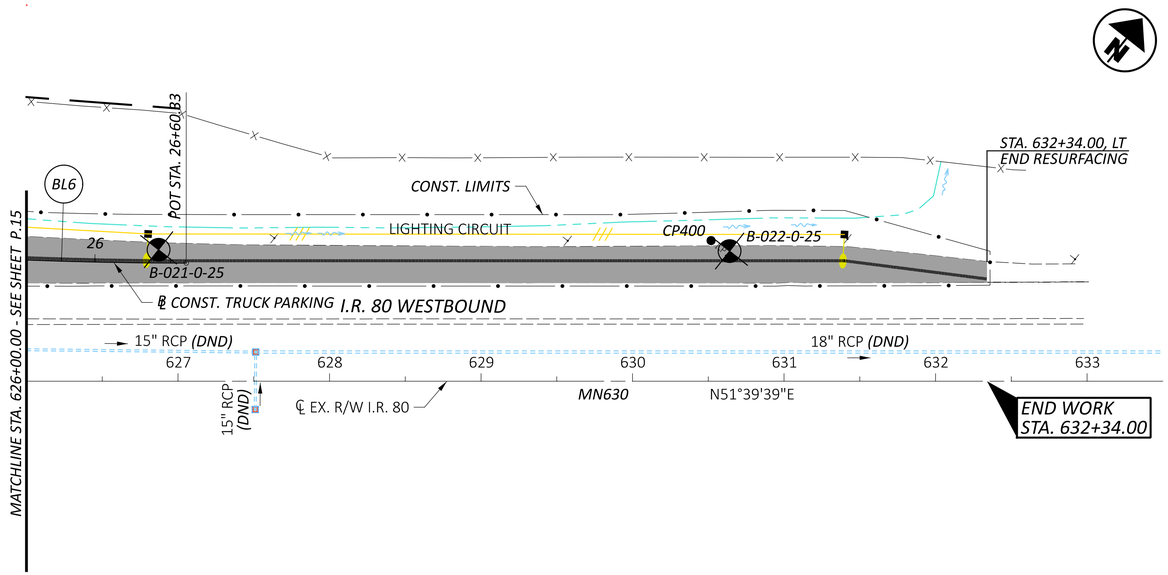

NOTES:

FOR PRIMARY PROJECT CONTROL & HORIZONTAL GEOMETRY CURVE DATA, SEE SHEET P.2
FOR ℄ CONST. TRUCK PARKING PROFILE, SEE SHEET P.16
FOR PAVEMENT DETAILS AND DIMENSIONS, SEE SHEETS P.44 - P.46
FOR DRIVE DETAILS, SEE SHEET P.50
FOR DEMOLITION PLAN, SEE SHEET P.51
FOR STORM SEWER PROFILE, SEE SHEET P.52

LEGEND:

LIMITS OF PAVEMENT RESURFACING

ITEM 670 - SLOPE EROSION PROTECTION (VEGETATED FILTER STRIP PC-BMP)

ESTABLISHED EX. VEGETATION CREDIT (VEGETATED FILTER STRIP PC-BMP)

HORIZONTAL SCALE IN FEET
0 25 50 100

I.R. 80 TRUCK PARKING - PLAN SHEET
I.R. 80 RESURFACING

TRU-80-11.32 TRUCK PARKING

MODEL: CLXRW801 - Plan 1 [Sheet] PAPERSIZE: 34x22 (in.) DATE: 6/10/2025 TIME: 10:30:19 AM USER: mphillip1
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-02\Documents\01 Active Projects\District 04\Trumbull\121698\400-Engineering\Roadway\Sheets\121698_GP000.dgn

DESIGN AGENCY

DESIGNER MEP
REVIEWER LMB 7/3/25
PROJECT ID 121698
SHEET P.13 TOTAL 61

PLATE 9

Appendix III

I. Geotechnical Design Checklists	
Project: TRU-80-11.32 Truck Parking	**PDP Path:**
PID: 121698	**Review Stage: 3**

Checklist	Included in This Submission
II. Reconnaissance and Planning	✓
III. A. Centerline Cuts III. B. Embankments III. C. Subgrade	✓
IV. A. Foundations of Structures IV. B. Retaining Wall	
V. A. Landslide Remediation V. B. Rockfall Remediation V. C. Wetland or Peat Remediation V. D. Underground Mine Remediation V. E. Surface Mine Remediation V. F. Karst Remediation	
VI. A. Geotechnical Profile VI. D. Geotechnical Reports	✓

II. Reconnaissance and Planning Checklist

C-R-S: TRU-80-11.32 Truck Parking	PID: 121698	Reviewer: BKS	Date: 7/8/2025

Reconnaissance		(Y/N/X)	Notes:
1	Based on Section 302.1 in the SGE, have the necessary plans been developed in the following areas prior to the commencement of the subsurface exploration reconnaissance:	X	Plans by others.
	Roadway plans		
	Structures plans		
	Geohazards plans		
2	Have the resources listed in Section 302.2.1 of the SGE been reviewed as part of the office reconnaissance?	Y	
3	Have all the features listed in Section 302.3 of the SGE been observed and evaluated during the field reconnaissance?	Y	
4	If notable features were discovered in the field reconnaissance, were the GPS coordinates of these features recorded?	X	

Planning - General		(Y/N/X)	Notes:
5	In planning the geotechnical exploration program for the project, have the specific geologic conditions, the proposed work, and historic subsurface exploration work been considered?	Y	
6	Has the ODOT Transportation Information Mapping System (TIMS) been accessed to find all available historic boring information and inventoried geohazards?	Y	Historic information was available; however, it could not be reused in this exploration.
7	Have the borings been located to develop the maximum subsurface information while using a minimum number of borings, utilizing historic geotechnical explorations to the fullest extent possible?	Y	
8	Have the topography, geologic origin of materials, surface manifestation of soil conditions, and any other special design considerations been utilized in determining the spacing and depth of borings?	Y	
9	Have the borings been located so as to provide adequate overhead clearance for the equipment, clearance of underground utilities, minimize damage to private property, and minimize disruption of traffic, without compromising the quality of the exploration?	Y	

II. Reconnaissance and Planning Checklist

Planning - General	(Y/N/X)	Notes:
10 Have the scaled boring plans, showing all project and historic borings, and a schedule of borings in tabular format, been submitted to the District Geotechnical Engineer?	Y	
The schedule of borings should present the following information for each boring:		
a. exploration identification number	Y	
b. location by station and offset	Y	
c. estimated amount of rock and soil, including the total for each for the entire program.	Y	
Planning – Exploration Number	(Y/N/X)	Notes:
11 Have the coordinates, stations and offsets of all explorations (borings, soundings, test pits, etc.) been identified?	Y	
12 Has each exploration been assigned a unique identification number, in the following format X-ZZZ-W-YY, as per Section 303.2 of the SGE?	Y	
13 When referring to historic explorations that did not use the identification scheme in 12 above, have the historic explorations been assigned identification numbers according to Section 303.2 of the SGE?	X	

II. Reconnaissance and Planning Checklist

Planning – Boring Types		(Y/N/X)	Notes:
14	Based on Sections 303.3 to 303.7.6 of the SGE, have the location, depth, and sampling requirements for the following boring types been determined for the project?	Y	
	Check all boring types utilized for this project:		
	Existing Subgrades (Type A)	✓	
	Roadway Borings (Type B)	✓	
	Embankment Foundations (Type B1)		
	Cut Sections (Type B2)		
	Sidehill Cut Sections (Type B3)		
	Sidehill Cut-Fill Sections (Type B4)		
	Sidehill Fill Sections on Unstable Slopes (Type B5)		
	Geohazard Borings (Type C)		
	Lakes, Ponds, and Low-Lying Areas (Type C1)		
	Peat Deposits, Compressible Soils, and Low Strength Soils (Type C2)		
	Uncontrolled Fills, Waste Pits, and Reclaimed Surface Mines (Type C3)		
	Underground Mines (C4)		
	Landslides (Type C5)		
	Rock Slope (Type C6)		
	Karst (Type C7)		
	Proposed Underground Utilities (Type D)		
	Structure Borings (Type E)		
	Bridges (Type E1)		
	Culverts (Type E2 a,b,c)		
	Retaining Walls (Type E3 a and b)		
	Noise Barrier (Type E4)		
	CCTV & High Mast Lighting Towers (Type E5)	✓	
	Buildings and Salt Domes (Type E6)		

III.C. Subgrade Checklist

C-R-S: TRU-80-11.32 Truck Parking	PID: 121698	Reviewer: BKS	Date: 7/8/2025

Use this Checklist in conjunction with the Subgrade design guidance in GDM Section 600
If you do not have any subgrade work on the project, you do not have to fill out this checklist.

Subgrade	(Y/N/X)	Notes:
1 Has the subsurface exploration adequately characterized the soil or rock according to GDM Section 600?	Y	
a. Has each sample been visually classified and inspected for the presence of gypsum? Has a moisture content been performed on each sample?	Y	
b. Has mechanical classification (Plastic Limit (PL), Liquid Limit (LL), and gradation testing) been done on at least two samples from each boring within six feet of the proposed subgrade?	Y	
c. Has the sulfate content of at least one sample from each boring within 3 feet of the proposed subgrade been determined, per Supplement 1122, Determining Sulfate Content in Soils?	Y	Boring B-018-0-25 encountered bedrock immediately beneath the pavement section granular base, thus no sulfate testing was performed at this location.
d. Has the sulfate content of all samples that exhibit gypsum crystals been determined?	X	No gypsum crystals observed.
e. Have A-2-5, A-4b, A-5, A-7-5, A-8a, or A-8b soils within the top 3 feet of the proposed subgrade been mechanically classified?	Y	A-4b soil was encountered in two borings (B-019-0-25 and B-022-0-25).
2 If soils classified as A-2-5, A-4b, A-5, A-7-5, A-8a, or A-8b, or having a LL>65, are present at the proposed subgrade (geotechnical profile), do the plans specify that these materials need to be removed and replaced or chemically stabilized?	Y	A-4b soil was encountered in two borings (B-019-0-25 and B-022-0-25). Remediation recommendations are presented in Table 6-1 of the report and the exhibit on Plates 7 through 9 in Appendix II. Plans to be prepared by others.
a. If these materials are to be removed and replaced, have the station limits, depth, and lateral limits for the planned removal been provided?	Y	Estimated areas for remediation are shown on Plates 7 through 9 of Appendix II.
3 If there is any rock, shale, or coal present at the proposed subgrade (C&MS 204.05), do the plans specify the removal of the material?	Y	Shallow bedrock requiring excavation was encountered in two borings (B-011-1-25 and B-018-0-25).
a. If removal of any rock, shale, or coal is required, have the station limits, depth, and lateral limits for the planned removal of the material at proposed subgrade been provided?	Y	Shallow bedrock requiring excavation was encountered in two borings (B-011-1-25 and B-018-0-25). Remediation recommendations are presented in Table 6-1 of the report and the exhibit on Plates 7 through 9 in Appendix II. Plans to be prepared by others.

III.C. Subgrade Checklist

Subgrade	(Y/N/X)	Notes:
4 In accordance with GDM Section 600, do the SPT (N_{60})/HP values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	Y	
a. If removal and replacement is applicable, has the detail of subgrade removal been shown on the plans, including depth of removal, station limits, lateral extent, replacement material, and plan notes (Item 204 - Subgrade Compaction and Proof Rolling)?	Y	Recommendations for possible global stabilization using excavate and replace method are provided in Section 6.2.3. Estimated areas for remediation are shown on Plates 7 through 9 of Appendix II.
b. If chemical stabilization is applicable, has the detail of this treatment been shown on the plans, including depth, percentage of chemical, station limits, lateral extent, and plan notes?	X	
Indicate type of chemcial stabilization specified:		
cement stabilization		
lime stabilization		
5 If removal and replacement has been specified, do the plans include Plan Note G121 from L&D3?	Y	Recommendation to include note in project plans is included in Section 6.2.3.
6 If drainage or groundwater is an issue with the proposed subgrade, has an appropriate drainage system (e.g., pipe, underdrains) been provided?	X	
7 Has an appropriate quantity of Proof Rolling (C&MS 204.06) and has Plan Note G111 from L&D3 been included in the plans?	X	Test and proof rolling is recommended. Plans being prepared by others.
8 Has a design CBR value been provided?	Y	

VI.B. Geotechnical Reports

C-R-S: TRU-80-11.32 Truck Parking	PID: 121698	Reviewer: BKS	Date: 7/8/2025

General		(Y/N/X)	Notes:
1	Has an electronic copy of all geotechnical submissions been provided to the District Geotechnical Engineer (DGE)?	Y	
2	Has the first complete version of a geotechnical report being submitted been labeled as 'Draft'?	Y	
3	Subsequent to ODOT's review and approval, has the complete version of the revised geotechnical report being submitted been labeled 'Final'?	Y	
4	Has the boring data been submitted in a native format that is DIGGS (Data Interchange for Geotechnical and Geoenvironmental) compatable? gINT files meet this demand?	Y	
5	Does the report cover format follow ODOT's Brand and Identity Guidelines Report Standards found at http://www.dot.state.oh.us/brand/Pages/default.aspx ?	Y	
6	Have all geotechnical reports being submitted been titled correctly as prescribed in Section 706.1 of the SGE?	Y	
Report Body		(Y/N/X)	Notes:
7	Do all geotechnical reports being submitted contain the following:	Y	
a.	an Executive Summary as described in Section 706.2 of the SGE?	Y	
b.	an Introduction as described in Section 706.3 of the SGE?	Y	
c.	a section titled "Geology and Observations of the Project," as described in Section 706.4 of the SGE?	Y	
d.	a section titled "Exploration," as described in Section 706.5 of the SGE?	Y	
e.	a section titled "Findings," as described in Section 706.6 of the SGE?	Y	
f.	a section titled "Analyses and Recommendations," as described in Section 706.7 of the SGE?	Y	
Appendices		(Y/N/X)	Notes:
8	Do all geotechnical reports being submitted contain all applicable Appendices as described in Section 706.8 of the SGE?	Y	
9	Do the Appendices present a site Boring Plan showing all boring locations as described in Section 706.8.1 of the SGE?	Y	

VI.B. Geotechnical Reports

Appendices		(Y/N/X)	Notes:
10	Do the Appendices include boring logs and color pictures of rock, if applicable, as described in Section 706.8.2 of the SGE?	Y	
11	Do the Appendices include reports of undisturbed test data as described in Section 706.8.3 of the SGE?	X	
12	Do the Appendices include calculations in a logical format to support recommendations as described in Section 706.8.4 of the SGE?	Y	