Subgrade Exploration Data Report - Final
MAH-76/80-8.50/0.00 Pavement Replacement
Austintown, Mahoning County, Ohio
S&ME Project No. 23170065E

PREPARED FOR:

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

PREPARED BY:

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016

May 21, 2025

May 21, 2025

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

Attention: Mr. Thomas Powell, P.E.

Reference: **Subgrade Exploration Data Report – Final**
MAH-76/80-8.50/0.00 Pavement Replacement (PID 122947)
Austintown, Mahoning County, Ohio
S&ME Project No. 23170065E, Task Order No. 04-04

District 4 Geotechnical Engineering Services Task Order
PID No. 117651; Agreement No. 38621

Mr. Powell:

In accordance with our revised proposal dated January 15, 2025, which was authorized by Encumbrance No. 743930 on January 24, 2025, by ODOT District 4 (D4), S&ME, Inc. (S&ME) has completed a Geotechnical Exploration for the MAH-76/80-8.50/0.00 Pavement Replacement project in Mahoning County, 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 January 2025 ODOT *Specifications for Geotechnical Explorations* (*SGE*), S&ME submitted a "draft" version of this report dated April 18, 2025, which was provided to ODOT Office of Geotechnical Engineering (OGE) for review. Comments on the draft report were provided by ODOT on April 29, 2025. This final report has been prepared to address ODOT's comments. At the request of ODOT D4, S&ME will not prepare ODOT Geotechnical Profile sheets for this project.

We appreciate the opportunity to be of service. Please do not hesitate to contact us if you have any questions concerning this report.

Respectfully,

S&ME, Inc.

Kevin A. Harper
Engineer | Deputy Project Manager

Brian K. Sears, P.E.
Senior Engineer | Project Manager

Senior Reviewer: Richard S. Weigand, P.E.
Submitted: Email copy (thomas.powell2@dot.ohio.gov)

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1.0 Executive Summary

ODOT has indicated that the existing pavement of portions of IR 76 and IR 80 east and west of Meander Reservoir has experienced premature deterioration and is to be completely replaced. As such, District 4 requested that S&ME perform a subgrade exploration program for the portions of these interstates from approximately 800 feet west of the bridge carrying the Ohio Turnpike over IR 76 to approximately 600 feet east of SR 46 in the eastbound travel lanes and to the west abutment of the bridge over a Mahoning Valley Sanitary District (MVSD) utility easement (SFN 5002583) in the westbound travel lanes. The project will be suspended within the limits of the bridge over Meander Creek Reservoir. Information from ODOT indicates that the subgrade soils from approximately 3,800 feet west of the reservoir to the eastern terminus of the project have previously been chemically (cement) stabilized.

Between February 24 and 28, 2025, S&ME performed twenty-nine (29) soil borings and pavement cores for this geotechnical exploration. Borings B-001-0-25 through B-009-0-25 were performed through the inside shoulders of eastbound and westbound IR 76/80, with continuous soil sampling performed in accordance with the ODOT *SGE*. Borings B-010-0-25 through B-029-0-25 were performed in the inside shoulder of IR 80 eastbound and in the outside shoulder of IR 80 westbound. After the pavement was cored in these borings, a representative sample of the existing granular base was obtained for gradation testing by either hand excavating, coring, or using a bucket auger. The total thickness of existing granular base was then measured on the sides of the bore hole. A Kessler DCP sounding was attempted in each boring, beginning at the top of the apparent cement stabilized layer reported to be present immediately beneath the granular base. Following the DCP sounding, 6 feet of continuous SPT sampling was attempted.

Twenty-eight of the borings encountered 11¾ to 15¼inches of concrete, with one boring encountering 15¼ inches of asphalt. Beneath the pavement, 9 to 13½ inches of granular base material were measured. Twenty-eight (28) of the borings then encountered existing fill or possible fill materials extending to depths ranging from 2.7 to 5.0 feet below existing grade. The uppermost 12 to 15 inches of the fill from B-010 to B-029 appeared to consist of probable/possible cement stabilized soil. In most of the borings, 0.8 to 6 feet of natural soil was encountered beneath the fill, and bedrock was encountered in 10 borings. Based upon observations made at the time of this investigation, groundwater seepage was encountered in only 4 of the 29 borings.

Unless shallow bedrock was encountered, sulfate content testing (ODOT Supplement 1122) was performed on soil samples obtained from within 3 feet of the existing subgrade level in Borings B-001 through B-009, and from within 3 feet of the bottom of the cement stabilized layer. The results of these tests indicated sulfate contents ranging from 152 to 1440 ppm.

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 Subgrade Analysis spreadsheet for this project, which includes the results of the current borings, and also the historic boring information provided by ODOT, is presented in Appendix D.

2.0 Introduction

ODOT has indicated that the existing pavement of a portion of IR 76 and IR 80 on the east and west sides of Meander Reservoir has experienced premature deterioration and is to be completely replaced. As such, District 4 requested that S&ME perform a subgrade exploration program for the portions of these interstates from approximately 800 feet west of the bridge carrying the Ohio Turnpike over IR 76 to approximately 600 feet east of SR 46 in the eastbound travel lanes and to the west abutment of the bridge over a Mahoning Valley Sanitary District (MVSD) utility easement (SFN 5002583) in the westbound travel lanes. The project will be suspended within the limits of the bridge over Meander Creek Reservoir. Information from ODOT indicates that the subgrade soils for the portion of the project from approximately 3,800 feet west of the reservoir to the eastern terminus of the project have previously been chemically (cement) stabilized.

The western 3,500 feet of the project was investigated using a standard ODOT *Specifications for Geotechnical Explorations* (*SGE*) subgrade exploration approach, while the remainder of the project to the east was investigated using a modified approach as directed by ODOT Office of Geotechnical Engineering (OGE). This modified approach included Type A subgrade borings, Kessler Dynamic Cone Penetrometer (DCP) soundings, granular base sampling, and additional visual observations to assess possible reasons for premature deterioration of the pavement.

2.1 Geology

The project site is located within a previously glaciated portion of the state in the Killbuck-Glaciated Pittsburgh Plateau physiographic region, which is described as ridges and flat uplands covered with a thin layer of drift and dissected by steep valleys. The soils are characterized by Wisconsinan-age clay to loam glacial till over Mississippian- and Pennsylvanian-age shales, sandstones, conglomerates, and coals.

The ground surface elevation along this section of highway ranges between approximate Elevation 917 and El. 1062. Ohio Department of Natural Resources (ODNR) bedrock topography mapping suggests the uppermost bedrock near this project consists of Ordovician-age limestone and shale which is likely present within 10 feet of the ground surface on the western side of the project (see the logs of Borings B-001 through B-009 in Appendix A) with occasional uplands within the eastern portion of the project.

The ODNR "Ohio Karst Areas" map indicates this project is not in an area of Ohio where karst bedrock may be present. The ODNR "Landslides in Ohio" map shows the project area is in an area with low incidence and low susceptibility to landslides. The ODNR "Abandoned Underground Mines of Ohio" map does not indicate any mapped abandoned mines in the immediate vicinity of the project site.

2.2 Site Reconnaissance

S&ME personnel visited this site on February 12, 2025, to observe the conditions at this project site with respect to traffic and site access, and to mark the planned subgrade boring locations. Many sections ranging from 5 to more than 100 feet in length have been repaired since construction in the late 2000's. Additionally, longitudinal and transverse cracking was observable in multiple areas that have not been repaired. The areas previously repaired are generally found in groups with multiple areas of spot repair followed by gaps where the pavement is in better overall condition with no repairs. The frequency of repaired areas and existing cracking is more prevalent in the

eastbound direction which coincides with the eastbound section having a Pavement Condition Rating (PCR) of 59 according to information provided by ODOT in an email on December 16, 2024. This rating falls into the "fair to poor" category of the rating system. The westbound section was generally in better condition coinciding with a PCR of 73 (fair condition). Station ranges of repaired areas generally include repairs in both directions.

3.0 Exploration

3.1 Available Information

Historic information including construction plan sets for the portion of IR 76/80 included in this project were provided to S&ME by ODOT D4. Included with one of the historic plan sets was a copy of soil profile sheets prepared by Gannett Fleming Engineers (GFE) which included roadway, embankment, and structure borings performed by GFE between 2002 and 2004. S&ME was also provided with copies of most but not all of these logs by ODOT OGE. A total of 50 historic borings were incorporated into the subgrade analysis along with the borings performed by S&ME. Logs of the 2002 borings incorporated into the subgrade analysis and provided by ODOT OGE are included in Appendix B.

3.2 Field Exploration

S&ME performed twenty-nine (29) total soil borings for this pavement replacement geotechnical exploration between February 24 and 28, 2025. At each boring location, S&ME obtained an 8-inch diameter core of the existing pavement. These cores were performed using a truck-mounted drilling rig to advance a diamond-impregnated core bit through the existing pavement. The thickness of each recovered core was measured in the field. The cores were then transported to our laboratory where they were remeasured and photographed. It should be noted that only the core at Boring B-026-0-25 encountered asphalt pavement. After the cores were removed from the existing pavement, the thickness of the underlying existing granular base was measured by hand excavation. The exploration methods employed at each boring location are described as follows:

- Borings B-001-0-25 to B-009-0-25 (Western End of Project – Standard Subgrade Exploration)

  These borings were performed through the inside shoulders of eastbound and westbound of IR 76/80, with continuous sampling performed in accordance with the ODOT *SGE*. Shallow bedrock was encountered in six (6) of these nine (9) borings. No bedrock coring was performed.

- Borings B-010-0-25 to B-029-0-25 (Eastern End of Project – Modified Subgrade Exploration)

  These twenty (20) borings were performed in the inside shoulder of IR 80 in the eastbound direction and in the outside shoulder of IR 80 in the westbound direction. After the pavement was cored, a representative sample of the existing granular base was obtained for gradation testing by either hand excavating, coring, or using a bucket auger. The total thickness of existing granular base was then measured on the sides of the bore hole.

A Kessler DCP sounding was attempted in each boring, beginning at the top of the cement stabilized layer reported to be present immediately beneath the granular base. If the DCP could not penetrate the stabilized layer, the DCP sounding was terminated. The borings were advanced with continuous SPT sampling to a depth of 6 feet below the top of the cement stabilized layer. Logs of the borings and DCP soundings are included in Appendix A.

The borings were performed by a truck-mounted drilling rig using 3¼-inch I.D. hollow-stem augers to advance the borings between sampling attempts. Disturbed but representative soil samples were continuously attempted 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). Continuous SPT sampling was performed to depths ranging from 3.6 feet to 8.5 feet before encountering refusal on bedrock or reaching the termination depth of the boring. The drill rig used for this exploration has been calibrated on December 30, 2024, in accordance with ASTM D4633 and has a drill rod energy of 88.9%.

At the completion of drilling, all borings were backfilled with soil cuttings mixed with approximately 20% bentonite gravel and a plastic hole closure device. The surface of the existing pavement was repaired using cold-patch asphalt at all boring locations.

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 Manager so that the exploration program could be modified in the event unusual or unexpected subsurface conditions were encountered. All samples were transported to the laboratory of S&ME for further identification and testing.

3.3 Laboratory Testing Program

In the laboratory, the soil samples were tested for natural moisture content in accordance with ODOT specifications, and two (2) sets of complete classification test series (liquid/plastic limit determination and sieve/short hydrometer analysis) were attempted to be performed on specimens recovered from each boring. In some borings, however, material type, inadequate recovery or shallow bedrock did not allow for the completion of both entire classification test series. Additionally, at the direction of ODOT OGE, classification testing was not performed on the SPT samples recovered from the apparent chemically stabilized soil in Borings B-010-0-25 through B-029-0-25.

At the direction of ODOT OGE, two (2) sulfate content tests were performed on unstabilized samples recovered from the borings within the eastern portion of the project (Borings B-010-0-25 through B-029-0-25), except at Boring B-025-0-25 where shallow bedrock was encountered. One (1) sulfate content test was also performed on a recovered sample within 3 feet of the existing subgrade level in six (6) of the nine (9) borings at the west end of the project. Sulfate tests were not performed in Borings B-001-0-25, B-003-0-25 and B-007-0-25 where coarse grained soils with insufficient material passing the #40 sieve and/or shallow bedrock was encountered.

Based on the results of the laboratory testing program, material descriptions contained on the field logs of the borings were modified, if necessary, and laboratory-corrected boring logs are included in Appendix A. Shown on

these logs are: descriptions of the soil and bedrock stratigraphy encountered; depths from which samples were preserved; sampling efforts (blow-counts) required to obtain the specimens in the borings; calculated N_{60} values for the SPT sample attempts; sampling depths; laboratory test results; seepage and groundwater observations; 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.

The soils have been classified in general accordance with Section 603 of the ODOT *SGE* and described in general 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 and bedrock, and information pertaining to sampling and identification are presented in the attachments. ODOT classifications, including Group Indices, determined from the results of the laboratory testing program are also provided on the current boring logs.

4.0 Findings

4.1 General Subsurface Conditions

Pavement – The borings were advanced through the existing shoulder pavement. Twenty-eight borings encountered 11¾ to 15¼ inches of concrete, and one boring (B-026) encountered 15¼ inches of asphalt. Photographs of the recovered cores are presented in Appendix C. Beneath the pavement materials, 9 to 13½ inches of granular base material were encountered. The results of grain size tests performed on samples recovered from Borings B-010 through B-29 indicated the granular base material consisted of GRAVEL (A-1-a) and GRAVEL WITH SAND (A-1-b). Numerical results of these tests are provided on the boring logs included as Plates 6 through 34 in Appendix A.

Existing/Possible Fill – Twenty-eight (28) borings encountered existing fill or possible fill extending to depths ranging from 2.7 to 5.0 feet below existing grade. These materials were composed of loose to dense brown and/or gray GRAVEL (A-1-a), medium dense to very dense brown and/or gray COARSE AND FINE SAND (A-3a), medium dense brown GRAVEL WITH SAND AND SILT (A-2-4), very dense brown and/or gray SANDY SILT (A-4a), medium dense to very dense brown and/or gray GRAVEL WITH SAND (A-1-b), very stiff to hard brown SILTY CLAY (A-6b), or very-stiff brown ELASTIC CLAY (A-7-5). The fill in Borings B-001, B-003, B-008, and B-009 extended to the underlying bedrock. Blue-ish gray slag fragments were noted within the fill encountered in Boring B-001. In Borings B-010 through B-029, the uppermost 12 to 15 inches of the fill appeared to have been previously cement stabilized.

Natural Soil –Twenty-five (25) borings encountered 0.8 to 6.0 feet of natural soil consisting variably of stiff to hard brown and/or gray SILT AND CLAY (A-6a), very stiff to hard or medium dense to dense gray and/or brown SANDY SILT (A-4a), loose to medium dense brown and/or gray FINE SAND (A-3), medium dense brown COARSE AND FINE SAND (A-3a), medium dense to very dense gray and/or brown GRAVEL WITH SAND (A-1-b), very dense brown GRAVEL WITH SAND AND SILT (A-2-4), stiff to hard brown SILTY CLAY (A-6b), very dense gray GRAVEL (A-1-a), very stiff to hard brown CLAY (A-7-6), and very stiff brown ELASTIC CLAY (A-7-5). Possible weathered shale

and sandstone cobbles and boulders were noted in Boring B-019 at a depth of 4.0 feet, and the silty clay beneath the cobbles and boulders was described as being similar to interbedded and severely weathered shale and sandstone. The SILT AND CLAY at the bottom of Boring B-002 contained shale fragments and was also similar in appearance to severely weathered shale bedrock.

Bedrock – To the west of Meander Reservoir, highly weathered gray SHALE was encountered at the depths of 3.5, 4.3, 3.2, and 3.1 feet in Borings B-001, B-002, and B-007, and B-008, respectively, whereas highly weathered gray LIMESTONE was encountered at a depth of 3.7 feet in Boring B-003, and highly weathered gray SANDSTONE was encountered at a depth of 3.1 feet in Boring B-009.

East of the reservoir, Borings B-026 encountered highly weathered gray SHALE at a depth of 7.3 feet. It should also be noted that several historic borings drilled in the vicinity of B-026 also reported encountering shale bedrock.

Please refer to the boring logs (Plates 6 through 34 in Appendix A) for more detailed information at each boring location. Inferences should not be made to the subsurface conditions in the areas between or away from the borings without the performance of additional borings or other field verifications.

4.2 Dynamic Cone Penetrometers

The results of the Dynamic Cone Penetrometer explorations performed at the subgrade level in Borings B-010 through B-029 are presented on Plates 35 through 54 of Appendix A. Only five (5) of the DCP's were able to be advanced through the apparent cement stabilized layer below the existing pavement.

4.3 Granular Base Observations

Recovered samples of the granular base at each boring in the eastern portion of the project were tested in the laboratory to determine the particle size distribution. Plots of the particle size distribution are included as Plates 40 through 44 of Appendix C and include a "shaded" region bracketing the gradation limits to meet the specifications of Item 304. In addition to the laboratory testing, visual descriptions were recorded and photos taken of the material remaining after testing. Photographs and visual descriptions of the granular base material have been included as Plates 30 through 39 of Appendix C.

Based on the laboratory test results and visual observations of the samples, we provide the following summary:

- Fourteen (14) of the samples do not meet the gradation specifications for Item 304 material. Thirteen (13) of these samples have more than 15% passing the #200 sieve (silt/clay), ranging from 16% to 22%.
- Most of the samples (from all borings except B-012, B-013, B-026 and B-029) have a similar appearance, frequently have more than 15% silt/clay and appear wet and "sticky". It is possible the elevated water content may be attributed to water introduced during coring. However, we note that the same amount of water would also have been introduced to other granular base samples which are not "sticking" together. This may indicate ineffective drainage of the base in these areas.
- Trace amounts of slag were only observed in the sample from Boring B-026 and the material was brown whereas the rest of the samples are gray. It is possible that slag may be present in the "sticky" samples described above; however, it is difficult to identify the slag without washing off the silt/clay portion.

Additionally, lab technicians performing the gradation testing did not observe consistent or significant quantities of slag in the samples during testing.

- The granular base material in Boring B-029 appears to include recycled concrete.

At the request of ODOT, the remaining portion of granular base material obtained during the exploration will be delivered to OGE with the pavement cores.

4.4 Groundwater Observations

During drilling, seepage was observed immediately below the existing granular base at a depth of 2.0 feet in Borings B-001 and B-021. More significant quantities of water were observed at the depths of 3.5 and 7.0 feet in Borings B-003 and B-028, respectively. No water was noted during drilling in the remaining 25 borings, and these borings were also "dry" at completion, meaning no measurable groundwater had accumulated in at the bottom of the boring. No long-term groundwater measurements were obtained in any of the borings.

4.5 Soil Sulfate Test Results

Sulfate content testing (ODOT Supplement 1122) was performed on soil samples obtained from twenty-eight (28) borings at the approximate proposed pavement subgrade level in the borings. The results of these tests indicated sulfate contents of 152 to 1440 ppm. These results are below the threshold value of 5,000 ppm identified by the ODOT *Geotechnical Design Manual* (*GDM*) as the sulfate content concentration above which chemical stabilization should not be performed. The results of these tests are provided on the log of each boring and on Plates 55 and 56 in Appendix A.

5.0 ODOT Subgrade Analysis

Section 600 of the ODOT *GDM* provides a standard approach to performing explorations and assessing roadway subgrades, and utilize a spreadsheet (Ver. 14.7, updated 11/6/2024) created by the ODOT Office of Geotechnical Engineering (OGE) to estimate roadway subgrade support parameters and identify areas which may require remediation. This spreadsheet (see Appendix D) 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.

The ODOT Subgrade Analysis spreadsheet also identifies subgrade soils which are "unsuitable" by either 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.

The subgrade remediation depths identified by the Subgrade Analysis spreadsheet presented in Appendix D are based on the conditions encountered in the borings during this subsurface investigation. At the request of ODOT, the spreadsheet also includes the historic boring information provided by ODOT. However, S&ME has not

included the moisture content test results from the historic borings because of the amount of time since this data was obtained, and because these values would no longer be applicable following the prior chemical stabilization operations.

6.0 Considerations and Report Limitations

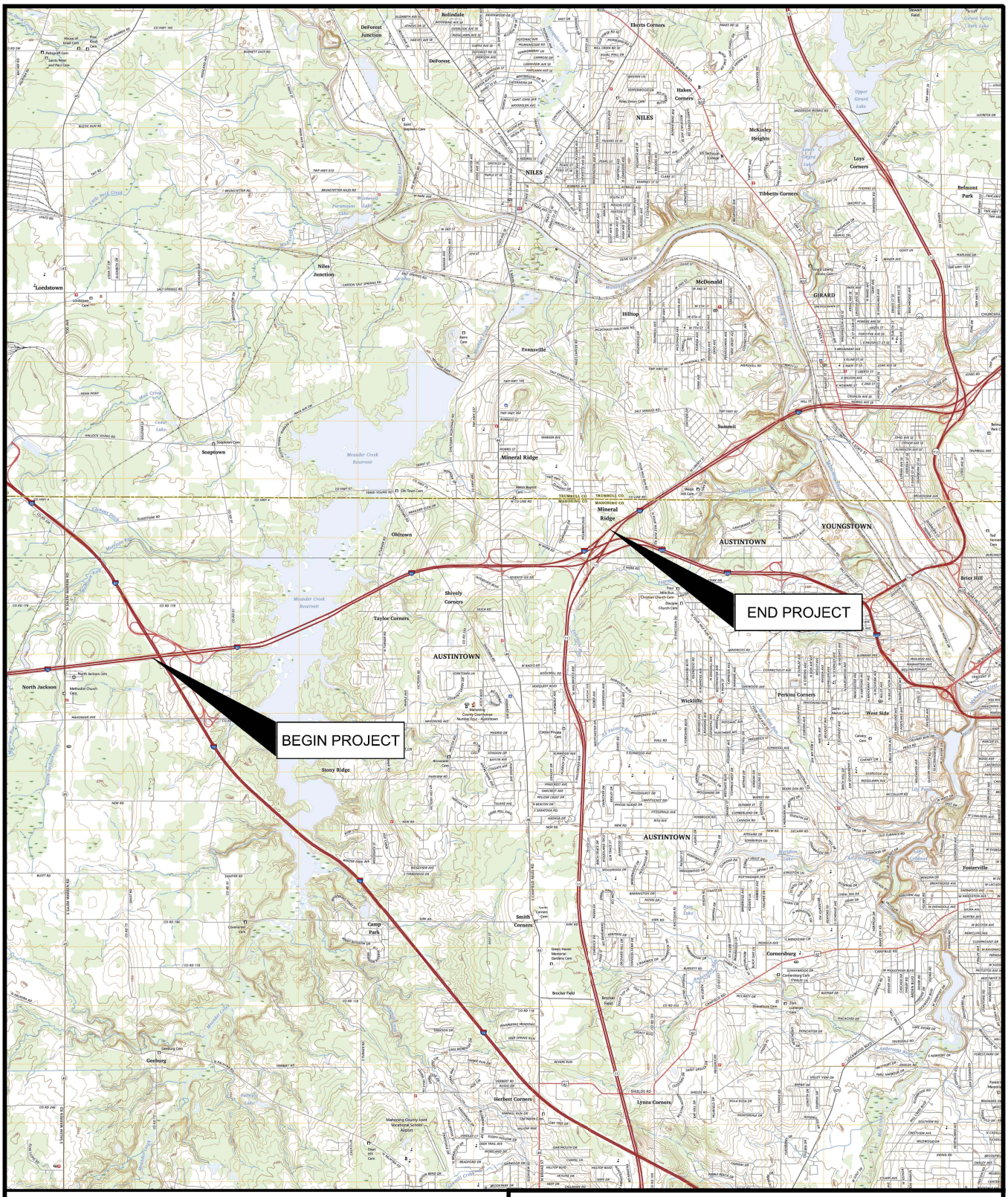
This data report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The information and conclusions contained in this report are based upon applicable standards of our practice in this geographic area at the time this report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

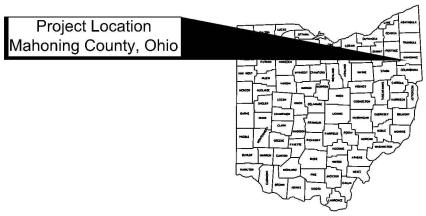
Our findings are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified.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

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.

Appendices

Appendix A – General Project Information





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Vicinity Map

MAH-76/80-8.50/0.00 Pavement Replacement
Mahoning County, Ohio

Project: 23-17-0065E	
Drawing Date: 3/12/2025	
Revision Date: 3/12/2025	
Drawn By: KAH	
Approved By: BKS	WWW.SMEINC.COM
Scale: GRAPHIC	ENGINEERING LICENSE NO: COA.03530

PLATE 1

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SCALE IN FEET

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LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH
Drawing Date: 3-12-2025	Approved By: BKS
Revision Date: 3-12-2025	Scale: GRAPHIC

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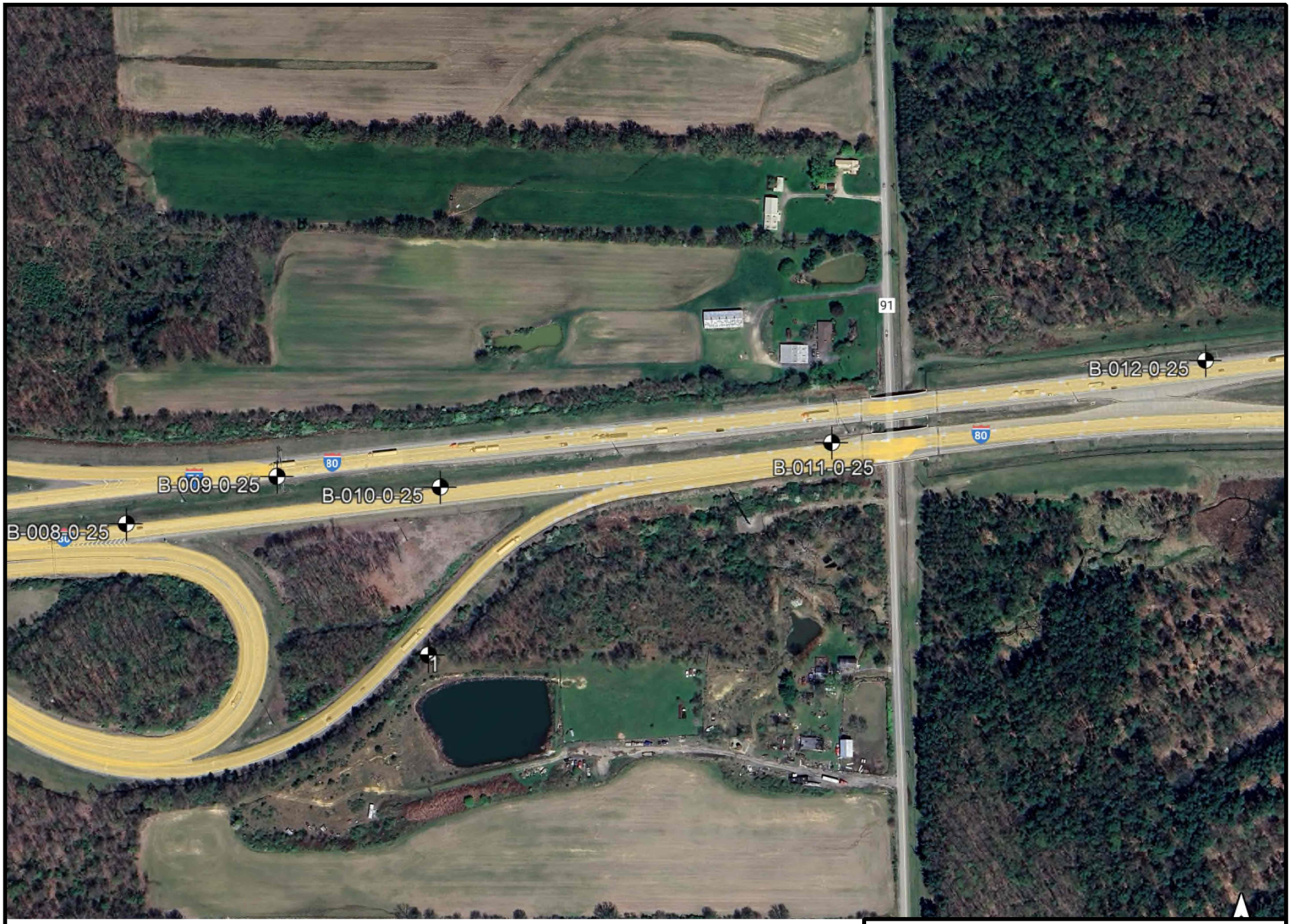
PLATE 2A



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SCALE IN FEET

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LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH
Drawing Date: 3-12-2025	Approved By: BKS
Revision Date: 3-12-2025	Scale: GRAPHIC

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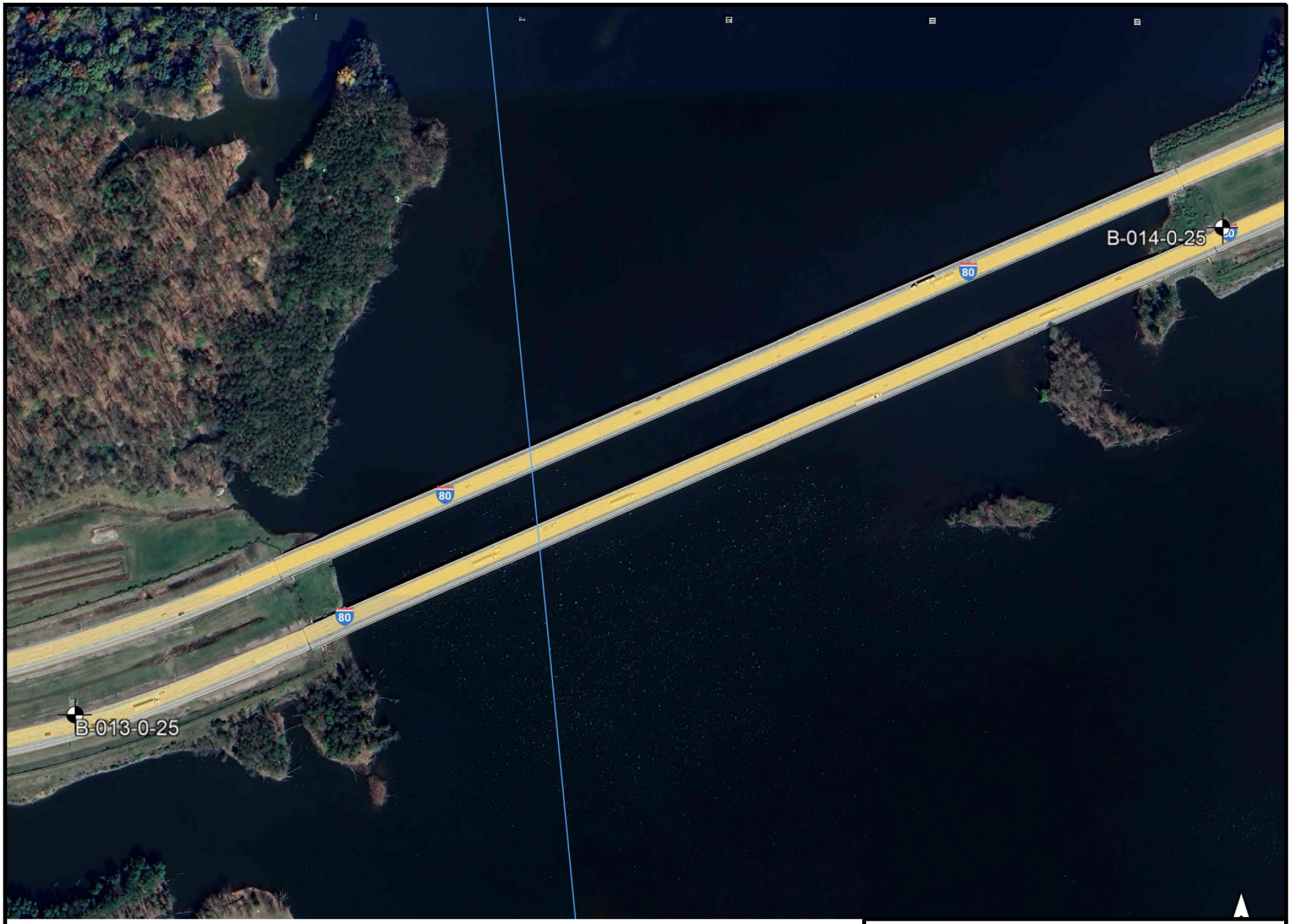
PLATE 2B



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SCALE IN FEET

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LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH
Drawing Date: 3-12-2025	Approved By: BKS
Revision Date: 3-12-2025	Scale: GRAPHIC

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PLATE 2C

0 350 700
SCALE IN FEET

LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH
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Revision Date: 3-12-2025	Scale: GRAPHIC

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PLATE 2D

0 350 700
SCALE IN FEET

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LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

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Revision Date: 3-12-2025	Scale: GRAPHIC

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PLATE 2E

0 350 700
SCALE IN FEET

N

LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH	WWW.SMEINC.COM
Drawing Date: 3-12-2025	Approved By: BKS	ENGINEERING LICENSE NO: COA.03530
Revision Date: 3-12-2025	Scale: GRAPHIC	

PLATE 2F

0 350 700
SCALE IN FEET

N

LEGEND

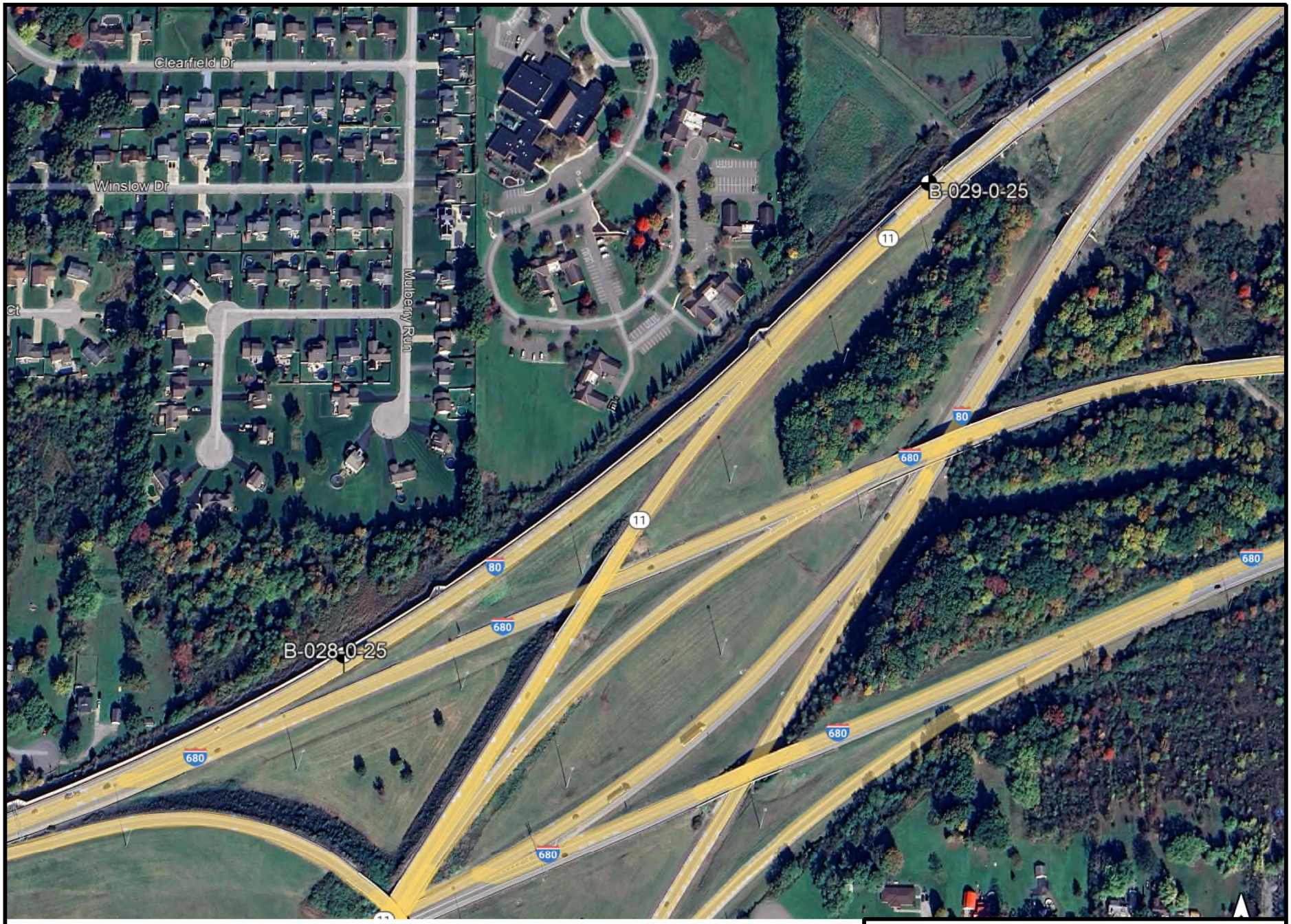
B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH	WWW.SMEINC.COM
Drawing Date: 3-12-2025	Approved By: BKS	ENGINEERING LICENSE NO: COA.03530
Revision Date: 3-12-2025	Scale: GRAPHIC	

PLATE 2G



0 350 700
SCALE IN FEET

LEGEND

B-001-0-25 BORING NUMBER AND LOCATION

PLAN OF BORINGS

MAH-76/80-8.50/0.00 PAVEMENT REPLACEMENT
MAHONING COUNTY, OHIO

Project: 23-17-0065E	Drawn By: KAH
Drawing Date: 3-12-2025	Approved By: BKS
Revision Date: 3-12-2025	Scale: GRAPHIC

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PLATE 2H

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.

2 3 4

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

—W **At Time of Drilling**	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.
At end of Drilling	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.
24 hrs After Drilling	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

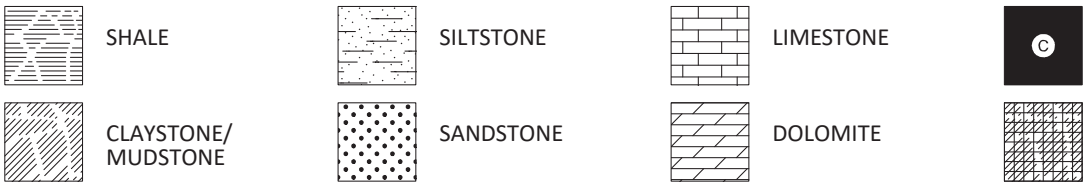
DESCRIPTIVE ORDER FOR ROCK STRATA

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



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.

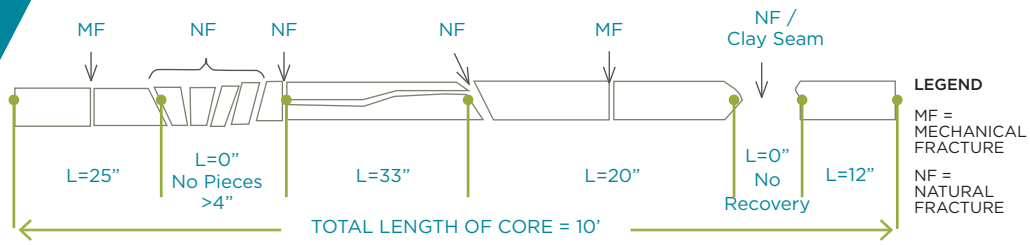
ODOT ROCK CORE LOG LEGEND

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

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 447+77, 41' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 989.5 (MSL) EOB: 4.1 ft.
START: 2/28/25 END: 2/28/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.109803 N, 80.840547 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 989.5	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
CONCRETE - 15 INCHES	988.2																		
GRANULAR BASE - 9 INCHES	987.5	W 987.5																	
FILL: Medium dense brown **GRAVEL**, little fine to coarse sand, trace silt, trace clay, few blue-gray slag fragments, moist.	986.0		3 6 7	19	100	SS-1	-	78	9	7	5	1	NP	NP	NP	10	A-1-a (0)	-	
SHALE, gray, highly weathered, very weak.	985.4	TR EOB	50/3"	-	100	SS-2	-	-	-	-	-	-	-	-	-	4	Rock (V)	-	

NOTES:
- Encountered seepage at 2.0' during drilling.
- Auger refusal at 4.1'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 452+04, 38' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 983.9 (MSL) EOB: 6.8 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.109722 N, 80.838974 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 983.9	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
CONCRETE - 14-3/4 INCHES	982.7																		
GRANULAR BASE - 9 INCHES	981.9																		
POSSIBLE FILL: Dense brown **GRAVEL**, "and" fine to coarse sand, trace silt, trace clay, damp.	980.4	1 2 3	12 10 12	33	100	SS-1	-	43	34	17	5	1	NP	NP	NP	41	A-1-b (0)	-	
Hard brown **SILT AND CLAY**, some fine to coarse gravel, some fine to coarse sand, few shale fragments, damp.	979.6	TR 4	13 50/5"	-	100	SS-2	4.5+	34	15	12	22	17	31	19	12	13	A-6a (1)	600	
SHALE, dark gray, highly weathered, very weak.		5	50/4"	-	100	SS-3	-	-	-	-	-	-	-	-	-	7	Rock (V)	-	
	977.1	EOB 6	50/4"	-	100	SS-4	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 456+07, 41' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 980.9 (MSL) EOB: 3.7 ft.
START: 2/28/25 END: 2/28/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110067 N, 80.837556 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 980.9	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
CONCRETE - 15 INCHES	979.6	1																	
GRANULAR BASE - 9 INCHES	978.9	2																	
POSSIBLE FILL: Loose brown **GRAVEL**, little fine to coarse sand, trace silt, trace clay, damp.	977.4	3	2 3 2	7	67	SS-1	-	81	9	5	4	1	-	-	-	6	A-1-a (V)	-	
LIMESTONE, gray, highly weathered, strong.	977.2	W 977.4 TR. ECS	50/2"	-	100	SS-2	-	-	-	-	-	-	-	-	-	11	Rock (V)	-	

NOTES:
- Groundwater was encountered at 3.5' during drilling.
- Auger refusal at 3.7'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 460+09, 38' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 978.0 (MSL) EOB: 8.0 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.109979 N, 80.836073 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
CONCRETE - 14-1/2 INCHES	976.7	1																	
GRANULAR BASE - 9 INCHES	976.0	2																	
POSSIBLE FILL: Medium dense to dense brown **COARSE AND FINE SAND**, little to some silt, trace to little fine to coarse gravel, trace clay, damp.	973.0	3	7 11 11	33	100	SS-1	-	13	15	51	17	4	NP	NP	NP	9	A-3a (0)	-	
		4	6 8 8	24	100	SS-2	-	10	21	43	22	4	NP	NP	NP	12	A-3a (0)	152	
Very stiff to hard gray **SILT AND CLAY**, trace fine to coarse sand, damp.	972.5	5	4 7 7	21	100	SS-3A	3.5-4.5	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		6				SS-3B	-	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
Medium dense gray **SANDY SILT**, little clay, damp.	970.0	7	3 4 4	12	100	SS-4	-	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
		EOB 8																	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 463+95, 41' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 975.8 (MSL) EOB: 8.0 ft.
START: 2/28/25 END: 2/28/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110318 N, 80.834717 W

EXPLORATION ID **B-005-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.8	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
CONCRETE - 15 INCHES	974.5	1																	
GRANULAR BASE - 9 INCHES	973.8																		
POSSIBLE FILL: Loose brown and gray **GRAVEL**, little fine to coarse sand, trace silt, trace clay, damp.	973.1	2	3 1 5	9	78	SS-1A	-	76	7	7	7	3	-	-	-	11	A-1-a (V)	-	
Loose brown **FINE SAND**, trace silt, trace clay, damp.	972.5	3				SS-1B	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
Medium dense brown **COARSE AND FINE SAND**, little fine gravel, little silt, trace clay, damp.	969.8	4 5	6 8 11	28	100	SS-2	-	13	18	50	14	5	NP	NP	NP	18	A-3a (0)	976	
Medium dense gray **FINE SAND**, trace silt, trace clay, few silt pockets, damp.	969.1	6	7 9 9	27	100	SS-3A	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
						SS-3B	-	-	-	-	-	-	-	-	-	18	A-3 (V)	-	
Medium dense gray **SANDY SILT**, little clay, trace fine to coarse gravel, damp.	967.8	7 EOB 8	4 7 8	22	100	SS-4	-	4	6	23	48	19	18	12	6	14	A-4a (6)	-	

NOTES:
- No groundwater was encountered during drilling.

NOTES: SEE ABOVE.

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

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 468+05, 38' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 973.0 (MSL) EOB: 4.8 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110233 N, 80.833202 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 973.0	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
CONCRETE - 14-3/4 INCHES	971.8	1																	
GRANULAR BASE - 9-1/2 INCHES	971.0	2																	
Very stiff brown **SANDY SILT**, little fine gravel, little clay, damp.	969.5	3	3 5 13	27	100	SS-1	3.0	14	19	23	30	14	23	14	9	13	A-4a (2)	-	
Very dense gray **SANDY SILT**, some clay, trace fine gravel, damp.	968.2	4 EOB	10 20 50/4"	-	100	SS-2	-	9	9	15	44	23	18	13	5	8	A-4a (6)	1344	

NOTES:
- No groundwater was encountered during drilling.
- Auger refusal at 5.0'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 472+07, 41' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 970.2 (MSL) EOB: 4.1 ft.
START: 2/28/25 END: 2/28/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110579 N, 80.831781 W

EXPLORATION ID **B-007-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 970.2	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
CONCRETE - 15 INCHES	968.9	1																	
GRANULAR BASE - 9 INCHES	968.2																		
POSSIBLE FILL: Loose brown **GRAVEL**, little fine to coarse sand, trace silt, trace clay, damp.	967.5	2	2 5 25	44	67	SS-1A	-	85	6	5	-	4 -	-	-	-	5	A-1-a (V)	-	
	967.0	TR 3				SS-1B	-	32	25	18	19	6	NP	NP	NP	19	A-1-b (0)	-	
Dense gray **GRAVEL WITH SAND**, little silt, trace clay, damp.	966.1	EOB 4	50/3"	-	100	SS-2	-	-	-	-	-	-	-	-	-	3	Rock (V)	-	
SHALE, gray, highly weathered, very weak.																			

NOTES:
- No groundwater was encountered during drilling.
- Auger refusal at 4.1'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 476+08, 37' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 967.6 (MSL) EOB: 4.8 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110493 N, 80.830308 W

EXPLORATION ID **B-008-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 967.6	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
CONCRETE - 14-1/2 INCHES	966.4																		
GRANULAR BASE - 9 INCHES	965.6																		
POSSIBLE FILL: Medium dense brown **GRAVEL WITH SAND AND SILT**, trace clay, damp.	964.5	TR	5 10 50/4"	-	100	SS-1	-	45	17	12	19	7	25	22	3	9	A-2-4 (0)	248	
SHALE, gray, highly weathered, very weak.	962.8	EOB	50/5"	-	100	SS-2	-	-	-	-	-	-	-	-	-	3	Rock (V)	-	

NOTES:
- No groundwater was encountered during drilling.
- Auger refusal at 4.8'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 479+82, 41' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 76
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 965.5 (MSL) EOB: 3.6 ft.
START: 2/28/25 END: 2/28/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110823 N, 80.828999 W

EXPLORATION ID **B-009-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 965.5	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
CONCRETE - 15 INCHES	964.2	1																	
GRANULAR BASE - 9 INCHES	963.5	2																	
POSSIBLE FILL: Loose brown **GRAVEL**, trace fine to coarse sand, trace silt, trace clay, damp.	962.4	3	3 50/3"	-	100	SS-1A	-	88	5	3	-	4 -	-	-	-	5	A-1-a (V)	360	
SANDSTONE, gray, highly weathered, slightly strong.	961.9	TR EOB				SS-1B	-	-	-	-	-	-	-	-	-	3	Rock (V)	-	

NOTES:
- No groundwater was encountered during drilling.
- Auger refusal at 3.6'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 483+94, 35' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 962.5 (MSL) EOB: 6.8 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.110744 N, 80.827478 W

EXPLORATION ID **B-010-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 962.5	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
CONCRETE - 15 INCHES	961.2																		
GRANULAR BASE - 9 INCHES	960.5					BS-0	-	60	13	8	19	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, little clay, trace fine gravel, probable cement stabilized, damp.	959.5		16 19 16	52	100	SS-1	-	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
Dense brown **SANDY SILT**, little clay, trace fine gravel, damp.	958.8		6 9 12	31	100	SS-2	4.5+	35	10	10	26	19	28	17	11	12	A-6a (2)	976	
Hard brown **SILT AND CLAY**, some fine gravel, little fine to coarse sand, few shale fragments, damp.	957.5		12 50/4"	-	100	SS-3	-	42	13	13	24	8	26	17	9	7	A-2-4 (0)	568	
Very dense brown **GRAVEL WITH SAND AND SILT**, trace clay, similar to highly weathered shale, damp.	955.7	EOB	50/4"	-	100	SS-4	-	-	-	-	-	-	-	-	-	5	A-2-4 (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 494+13, 35' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 953.2 (MSL) EOB: 8.0 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.111068 N, 80.823805 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 953.2	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
CONCRETE - 13-1/4 INCHES	952.0																		
GRANULAR BASE - 10-1/2 INCHES	951.2					BS-0	-	69	9	6	16	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, trace clay, trace fine gravel, probable cement stabilized, damp.	950.2	1 2 3	16 50/5"	-	100	SS-1	-	-	-	-	-	-	-	-	-	20	A-4a (V)	-	
Stiff gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	948.2	4 5	3 3 3	9	100	SS-2	1.5	1	3	8	47	41	31	18	13	25	A-6a (9)	792	
Hard brown **SILTY CLAY**, trace fine to coarse sand, trace fine gravel, damp.	945.2	6 7 8 EOB	4 7 10	25	100	SS-3	4.5+	4	2	7	39	48	34	18	16	16	A-6b (10)	256	
			11 9 14	34	100	SS-4	4.5+	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 503+95, 72' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 937.1 (MSL) EOB: 8.0 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.111671 N, 80.820311 W

EXPLORATION ID **B-012-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 937.1	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
CONCRETE - 13 INCHES	936.0																		
GRANULAR BASE - 11 INCHES	935.1	1				BS-0	-	97	2	0	- 1	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, some clay, trace fine gravel, probable cement stabilized, damp.	934.1	2	50/5"	-	100	SS-1	-	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
Hard brown **SANDY SILT**, some clay, trace fine gravel, damp.	932.9	3	5 6 6	18	100	SS-2A	4.0-4.5+	4	9	22	44	21	24	15	9	16	A-4a (6)	-	
Very stiff brown **SILT AND CLAY**, "and" fine to coarse sand, little fine to coarse gravel, damp.	931.9	4				SS-2B	3.75	13	16	31	20	20	27	14	13	13	A-6a (2)	232	
Medium dense brown **SANDY SILT**, little clay, trace fine to coarse gravel, damp.	929.1	5	3 5 6	16	100	SS-3	-	9	7	19	46	19	23	16	7	18	A-4a (6)	184	
		6	4 4 5	13	100	SS-4	-	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
		7																	
		8 EOB																	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 514+16, 127' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 920.4 (MSL) EOB: 8.0 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.111623 N, 80.816507 W

EXPLORATION ID **B-013-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 920.4	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
CONCRETE - 12-3/4 INCHES	919.3																		
GRANULAR BASE - 11 INCHES	918.4					BS-0	-	73	7	5	15	-	-	-	-	-	A-1-a (V)	-	
FILL: Very dense brown **SANDY SILT**, trace clay, trace fine gravel, probable cement stabilized, damp.	917.4	1	19 39 15	80	100	SS-1	-	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
Medium dense to dense brown **SANDY SILT**, trace clay, trace fine gravel, damp.	916.9	2	4 5 4	13	100	SS-2	3.0	2	3	24	43	28	24	14	10	17	A-4a (7)	264	
Very stiff gray **SANDY SILT**, some clay, trace fine gravel, damp.	915.4	3	2 3 4	10	100	SS-3	2.5	1	1	7	45	46	34	19	15	23	A-6a (10)	784	
Very stiff to hard brown **SILT AND CLAY**, trace fine to coarse sand, trace fine gravel, damp.	912.4	4	3 5 7	18	100	SS-4	4.5+	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
		5																	
		6																	
		7																	
		8 EOB																	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 546+21, 126' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 921.5 (MSL) EOB: 8.0 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.115109 N, 80.805769 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 921.5	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
CONCRETE - 14-1/4 INCHES	920.3																		
GRANULAR BASE - 10 INCHES	919.5					BS-0	-	74	8	5	13	-	-	-	-	-	A-1-a (V)	-	
FILL: Dense gray **GRAVEL**, some fine to coarse sand, trace silt, trace clay, possible cement stabilized, dry.	918.5	1	10 10 12	33	100	SS-1	-	-	-	-	-	-	-	-	-	4	A-1-a (V)	-	
Very dense gray **GRAVEL**, some fine to coarse sand, trace silt, trace clay, dry.	916.5	2 3 4	14 17 18	52	100	SS-2	-	59	18	11	7	5	17	11	6	3	A-1-a (0)	952	
Dense gray **GRAVEL WITH SAND AND SILT**, trace clay, dry.	913.5	5 6 7 8 EOB	16 14 11	37	100	SS-3	-	58	20	8	7	7	21	14	7	5	A-2-4 (0)	904	
			7 15 16	46	100	SS-4	-	-	-	-	-	-	-	-	-	3	A-2-4 (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 556+15, 72' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 917.0 (MSL) EOB: 8.0 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.116721 N, 80.802776 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 917.0	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
CONCRETE - 14-1/4 INCHES	915.8																		
GRANULAR BASE - 10 INCHES	915.0					BS-0	-	64	15	7	14	-	-	-	-	-	A-1-a (V)	-	
FILL: Very dense brown **COARSE AND FINE SAND**, little silt, trace clay, trace fine gravel, probable cement stabilized, damp.	914.0 / 913.5	1 2 3	20 31 10	61	100	SS-1	-	-	-	-	-	-	-	-	-	21	A-3a (V)	-	
Medium dense brown **COARSE AND FINE SAND**, little silt, trace clay, trace fine gravel, damp.	912.0	4 5	2 3 4	10	100	SS-2	2.75-4.0	12	12	9	27	40	42	26	16	19	A-7-6 (9)	1024	
Very stiff brown **CLAY**, some silt, some fine to coarse sand, little fine gravel, damp.		6	4 6 4	15	100	SS-3	2.5	38	8	10	27	17	31	17	14	12	A-6a (3)	1104	
Very stiff gray **SILT AND CLAY**, "and" fine to coarse gravel, little fine to coarse sand, damp.	909.0	7 8 EOB	2 2 6	12	100	SS-4	2.5	-	-	-	-	-	-	-	-	11	A-6a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 566+27, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 920.5 (MSL) EOB: 8.0 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.117758 N, 80.799377 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 920.5	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
CONCRETE - 11-3/4 INCHES	919.5																		
GRANULAR BASE - 12 INCHES	918.5					BS-0	-	70	9	5	16	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, trace fine gravel, trace clay, probable cement stabilized, damp.	917.5	1 2 3	43 50/1"	-	100	SS-1	-	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
Hard gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	915.5	4 5	3 4 5	13	100	SS-2	4.0-4.5+	10	6	13	30	41	33	18	15	17	A-6a (9)	352	
Stiff to very stiff brown **SILTY CLAY**, some fine to coarse gravel, some fine to coarse sand, damp.	912.5	6 7 8 EOB	3 4 3	10	78	SS-3	2.0-3.0	27	9	12	21	31	33	16	17	13	A-6b (6)	240	
			2 3 2	7	100	SS-4	1.0-1.5	-	-	-	-	-	-	-	-	19	A-6b (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 576+32, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 934.2 (MSL) EOB: 8.0 ft.
START: 2/26/25 END: 2/26/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.119040 N, 80.796147 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 934.2	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
CONCRETE - 14 INCHES	933.0																		
GRANULAR BASE - 10 INCHES	932.2					BS-0	-	63	9	6	22	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, trace fine gravel, trace clay, probable cement stabilized, moist.	931.2		37 32 17	73	100	SS-1	-	-	-	-	-	-	-	-	-	22	A-4a (V)	-	
Dense brown **SANDY SILT**, trace fine gravel, trace clay, damp.	930.7		4 9 10	28	100	SS-2	4.5+	2	2	5	29	62	40	21	19	17	A-6b (12)	232	
Hard brown **SILTY CLAY**, little fine to coarse sand, trace fine gravel, damp.			5 8 12	30	100	SS-3	4.5+	3	4	6	25	62	39	20	19	18	A-6b (12)	576	
	926.2	EOB	4 6 9	22	100	SS-4	4.5+	-	-	-	-	-	-	-	-	21	A-6b (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 586+90, 72' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 952.5 (MSL) EOB: 8.0 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.120619 N, 80.792904 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 952.5	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
CONCRETE - 15-1/4 INCHES	951.2																		
GRANULAR BASE - 9 INCHES	950.5					BS-0	-	63	10	7	20	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **GRAVEL WITH SAND**, little silt, trace clay, probable cement stabilized, moist.	949.5	1 2 3	29 50/2"	-	100	SS-1	-	-	-	-	-	-	-	-	-	25	A-1-b (V)	-	
Medium dense brown and gray **GRAVEL WITH SAND**, trace silt, trace clay, wet.	947.5	4 5	5 10 6	24	100	SS-2	-	30	40	20	8	2	-	-	-	44	A-1-b (V)	856	
Very stiff gray **SANDY SILT**, some clay, some fine gravel, few shale fragments, damp.	944.5	6 7 8 EOB	2 1 2	4	100	SS-3	-	27	5	7	28	33	28	19	9	13	A-4a (5)	624	
			1 3 4	10	100	SS-4	2.5	-	-	-	-	-	-	-	-	16	A-4a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 596+07, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 968.9 (MSL) EOB: 8.0 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.121556 N, 80.789799 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 968.9	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
CONCRETE - 13-3/4 INCHES	967.8																		
GRANULAR BASE - 10 INCHES	966.9	1				BS-0	-	56	18	8	18	-	-	-	-	-	A-1-b (V)	-	
FILL: Very stiff brown **ELASTIC CLAY**, "and" fine to coarse sand, some silt, trace fine gravel, possible cement stabilized, damp.	965.9	2	3 7 9	24	100	SS-1	3.0	-	-	-	-	-	-	-	-	23	A-7-5 (V)	-	
Very stiff brown **ELASTIC CLAY**, "and" fine to coarse sand, some silt, trace fine gravel, damp.	964.7	3	5 50/5"	-	100	SS-2A	2.0	4	19	26	27	24	53	37	16	35	A-7-5 (6)	408	
POSSIBLE COBBLES AND BOULDERS (highly weathered shale and sandstone)	962.9	4				SS-2B	-	-	-	-	-	-	-	-	-	5	Visual (V)	-	
Hard brown **SILTY CLAY**, little fine to coarse sand, trace fine gravel, similar to severely weathered shale and sandstone, damp.	960.9	5	50/5"	-	100	SS-3	-	-	-	-	-	-	-	-	-	5	Visual (V)	-	
		6																	
		7	17 27 22	73	100	SS-4	4.5+	1	5	8	42	44	35	18	17	11	A-6b (11)	576	
		8 EOB																	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 606+29, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 998.2 (MSL) EOB: 8.0 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.122651 N, 80.786401 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 998.2	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
CONCRETE - 12-1/2 INCHES	997.1																		
GRANULAR BASE - 11-1/2 INCHES	996.2					BS-0	-	56	15	9	20	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **GRAVEL WITH SAND**, little silt, trace clay, probable cement stabilized, damp.	995.2	1	22 37 19	83	100	SS-1	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	-	
Dense brown **GRAVEL WITH SAND**, little silt, trace clay, damp.	994.7	2	3 5 7	18	100	SS-2	4.5+	9	4	9	41	37	32	18	14	14	A-6a (10)	616	
Hard brown **SILT AND CLAY**, little fine to coarse sand, trace to little fine gravel, damp.		3	4 6 7	19	100	SS-3	4.5+	11	6	10	36	37	32	19	13	16	A-6a (9)	432	
	990.2	4	4 7 9	24	100	SS-4	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		5																	
		6																	
		7																	
		8 EOB																	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 616+42, 71' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1029.3 (MSL) EOB: 8.0 ft.
START: 2/25/25 END: 2/25/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123619 N, 80.782926 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1029.3	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
CONCRETE - 14-1/4 INCHES	1028.1																		
GRANULAR BASE - 10 INCHES	1027.3	W 1027.3				BS-0	-	68	11	6	15	-	-	-	-	-	A-1-a (V)	-	
FILL: Medium dense brown and gray **COARSE AND FINE SAND**, little silt, trace clay, trace fine gravel, possible cement stabilized, moist.	1026.2		9 15 10	37	100	SS-1A	-	-	-	-	-	-	-	-	-	43	A-3a (V)	-	
						SS-1B	4.0	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
Hard brown **SILTY CLAY**, little to some fine to coarse sand, little fine gravel, damp.	1024.3		2 5 3	12	100	SS-2	4.5+	14	6	14	33	33	31	15	16	16	A-6b (9)	168	
Very stiff to hard brown and reddish brown mottled with gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp to moist.			3 6 9	22	100	SS-3	4.5+	8	3	13	42	34	31	17	14	17	A-6a (10)	328	
- Between 6.5' to 6.7'; reddish brown sand seam.			4 4 3	10	100	SS-4A	-	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
						SS-4B	2.7-3.0	-	-	-	-	-	-	-	-	26	A-6a (V)	-	
	1021.3	EOB																	

NOTES:
- Seepage was encountered at 2.0' during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 626+47, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1046.4 (MSL) EOB: 8.0 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123694 N, 80.779254 W

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

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1046.4	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
CONCRETE - 13 INCHES	1045.3																		
GRANULAR BASE - 10-1/2 INCHES	1044.4					BS-0	-	76	6	4	14	-	-	-	-	-	A-1-a (V)	-	
FILL: Very dense brown **SANDY SILT**, little fine to coarse gravel, little clay, probable cement stabilized, damp.	1043.4		25 37 23	89	100	SS-1	-	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
Dense brown **SANDY SILT**, little fine to coarse gravel, little clay, damp.	1042.9		3 6 9	22	100	SS-2	3.5	30	10	16	23	21	29	18	11	13	A-6a (2)	240	
Very stiff to hard brown **SILT AND CLAY**, some fine to coarse sand, some fine to coarse gravel, damp.			4 9 6	22	100	SS-3	4.5+	23	10	23	23	21	27	15	12	12	A-6a (2)	312	
	1038.4	EOB	4 7 8	22	100	SS-4	4.5+	-	-	-	-	-	-	-	-	14	A-6a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 636+38, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1048.2 (MSL) EOB: 8.0 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123724 N, 80.775662 W

EXPLORATION ID **B-023-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1048.2	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
CONCRETE - 14-1/4 INCHES	1047.0	1																	
GRANULAR BASE - 10 INCHES	1046.2					BS-0	-	59	14	8	19	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, little clay, trace fine gravel, probable cement stabilized, damp.	1045.2	2 3	29 50/5"	-	100	SS-1	-	-	-	-	-	-	-	-	-	19	A-4a (V)	-	
Hard brown **SILT AND CLAY**, little to some fine to coarse sand, some fine to coarse gravel, damp.	1043.2	4 5	3 9 10	28	100	SS-2	4.5+	21	7	13	31	28	27	16	11	11	A-6a (5)	1360	
Hard gray **SILT AND CLAY**, little fine to coarse sand, trace fine gravel, damp.	1040.2	6 7 8 EOB	4 5 7	18	100	SS-3	4.5+	7	7	12	37	37	27	14	13	13	A-6a (9)	984	
			3 6 6	18	100	SS-4	4.5+	-	-	-	-	-	-	-	-	16	A-6a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 646+37, 70' LT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1033.7 (MSL) EOB: 8.0 ft.
START: 2/24/25 END: 2/24/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123990 N, 80.772038 W

EXPLORATION ID **B-024-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1033.7	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
CONCRETE - 14 INCHES	1032.5	1																	
GRANULAR BASE - 10 INCHES	1031.7					BS-0	-	69	9	6	- 16 -		-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown and gray **SANDY SILT**, trace fine gravel, trace clay, probable cement stabilized, damp.	1030.7	2	33 50/1"	-	100	SS-1	-	-	-	-	-	-	-	-	-	21	A-4a (V)	-	
Very stiff to hard brown **SILT AND CLAY**, little to some fine to coarse sand, trace to little fine gravel, damp.		3																	
		4	3 4 5	13	100	SS-2	4.5+	7	6	11	37	39	31	16	15	17	A-6a (10)	1440	
		5	2 2 4	9	100	SS-3	4.5+	11	7	20	28	34	27	14	13	15	A-6a (7)	1232	
		6																	
		7	4 7 4	16	100	SS-4	3.0	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	1025.7	EOB 8																	

NOTES
- No groundwater was encountered during drilling

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 655+48, 23' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1030.5 (MSL) EOB: 5.2 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123742 N, 80.768731 W

EXPLORATION ID **B-025-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1030.5	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
CONCRETE - 13-1/2 INCHES	1029.4																		
GRANULAR BASE - 10-1/2 INCHES	1028.5					BS-0	-	63	9	7	21	-	-	-	-	-	A-1-b (V)	-	
FILL: Medium dense gray **GRAVEL WITH SAND**, trace silt, trace clay, possible cement stabilized, damp.	1027.5	1	7 9 12	31	100	SS-1	-	-	-	-	-	-	-	-	-	5	A-1-b (V)	-	
Dense to very dense brown and gray **GRAVEL WITH SAND**, trace silt, trace clay, damp.	1025.3	2 3 4 5 EOB	10 15 50/2"	-	100	SS-2	-	51	10	23	16	-	-	-	-	10	A-1-b (V)	208	
			50/2"	-	100	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	

NOTES:
- No groundwater was encountered during drilling.
- Auger refusal at 5.2'.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET: 663+46, 22' RT
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1039.2 (MSL) EOB: 8.0 ft.
START: 2/27/25 END: 2/27/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.123751 N, 80.765833 W

EXPLORATION ID **B-026-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1039.2	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
ASPHALT - 15-1/4 INCHES	1037.9	1																	
GRANULAR BASE - 9 INCHES	1037.2	2				BS-0	-	73	10	8	9	-	-	-	-	-	A-1-a (V)	-	
FILL: Very stiff brown **SILTY CLAY**, some fine to coarse sand, trace fine gravel, possible cement stabilized, damp.	1036.2	3	2 3 5	12	100	SS-1	2.5	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
Very stiff to hard brown **SILTY CLAY**, some fine to coarse sand, trace fine gravel, damp.	1034.2	4	4 4 6	15	100	SS-2	4.5+	3	8	14	32	43	33	17	16	15	A-6b (10)	336	
Hard brown **CLAY**, some silt, trace fine to coarse sand, damp.	1031.9	5	3 7 9	24	100	SS-3	4.5+	2	2	3	27	66	43	22	21	21	A-7-6 (13)	264	
SHALE, gray, highly weathered, very weak.	1031.2	6 TR EOB 8	3 11 50	90	100	SS-4A	4.5+	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
						SS-4B	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET:
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1061.3 (MSL) EOB: 8.0 ft.
START: 2/24/25 END: 2/24/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.124229 N, 80.758246 W

EXPLORATION ID **B-027-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1061.3	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
CONCRETE - 13-3/4 INCHES	1060.2																		
GRANULAR BASE - 10 INCHES	1059.3	1				BS-0	-	66	11	7	- 16	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, trace clay, trace fine gravel, probable cement stabilized, damp.	1058.3	2	50/5"	-	100	SS-1	-	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
Hard gray **SANDY SILT**, some fine gravel, some clay, damp.	1056.1	3 4	6 4 4	12	100	SS-2	4.5+	23	10	12	33	22	23	14	9	10	A-4a (4)	288	
Hard brown **SILT AND CLAY**, little to some fine to coarse sand, little fine to coarse gravel, damp.	1053.3	5 6 7 8 EOB	4 5 5	15	100	SS-3	4.5+	16	8	12	37	27	27	15	12	12	A-6a (7)	672	
			4 9 12	31	100	SS-4	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:02 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET:
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1054.4 (MSL) EOB: 8.0 ft.
START: 2/24/25 END: 2/24/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.126040 N, 80.751561 W

EXPLORATION ID **B-028-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1054.4	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
CONCRETE - 13-3/4 INCHES	1053.2																		
GRANULAR BASE - 10 INCHES	1052.4					BS-0	-	58	14	8	20	-	-	-	-	-	A-1-b (V)	-	
FILL: Very dense brown **SANDY SILT**, little clay, trace fine gravel, probable cement stabilized, damp.	1051.1		16 24 16	59	100	SS-1A	-	-	-	-	-	-	-	-	-	31	A-4a (V)	-	
						SS-1B	4.5+	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
Hard brown **SILT AND CLAY**, some fine to coarse sand, little fine to coarse gravel, damp.	1049.4		4 4 5	13	100	SS-2	4.5+	16	8	17	32	27	29	15	14	17	A-6a (6)	384	
Hard brown **SILTY CLAY**, little fine to coarse sand, trace fine gravel, damp.			4 7 8	22	100	SS-3	4.5+	5	3	10	31	51	39	17	22	18	A-6b (13)	408	
		W 1047.4	4 6 5	16	100	SS-4	4.5+	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
	1046.4	EOB																	

NOTES:
- Groundwater was encountered at 7.0' during drilling.

NOTES: SEE ABOVE.

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

S&ME JOB: 23-17-0065E

PROJECT: MAH-76/80-8.50/0.00	DRILLING FIRM / OPERATOR: OTB / J. MINCHAK	DRILL RIG: OTB SIMCO 2800	STATION / OFFSET:
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: S&ME / K. HARPER	HAMMER: CME AUTOMATIC	ALIGNMENT: IR 80
PID: 122947 BR ID: N/A	DRILLING METHOD: 3-1/4" HSA	CALIBRATION DATE: 12/30/24	ELEVATION: 1049.3 (MSL) EOB: 8.5 ft.
START: 2/24/25 END: 2/24/25	SAMPLING METHOD: SPT	ENERGY RATIO (%): 88.9	LAT / LONG: 41.129300 N, 80.746298 W

EXPLORATION ID **B-029-0-25**

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1049.3	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
CONCRETE - 13-1/4 INCHES	1048.2																		
GRANULAR BASE - 13-1/2 INCHES	1047.1					BS-0	-	50	16	17	- 17 -		-	-	-	-	A-1-b (V)	-	
FILL: Hard brown **SILTY CLAY**, some fine to coarse sand, trace to little fine gravel, possible cement stabilized, damp.	1045.8	1 2 3 4 5 6 7 8	7 5 7	18	100	SS-1	4.5+	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
Hard brown **SILTY CLAY**, some fine to coarse sand, trace to little fine gravel, damp.	1043.8		5 5 8	19	100	SS-2	4.5+	10	5	19	36	30	30	14	16	18	A-6b (9)	424	
Hard brown becoming gray **SILT AND CLAY**, little fine to coarse sand, little fine gravel, damp.	1040.8	EOB	6 6 9	22	100	SS-3	4.5+	18	7	13	38	24	25	14	11	10	A-6a (6)	408	
			3 6 8	21	100	SS-4	4.5+	-	-	-	-	-	-	-	-	19	A-6a (V)	-	

NOTES:
- No groundwater was encountered during drilling.

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 - 4/18/25 17:03 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

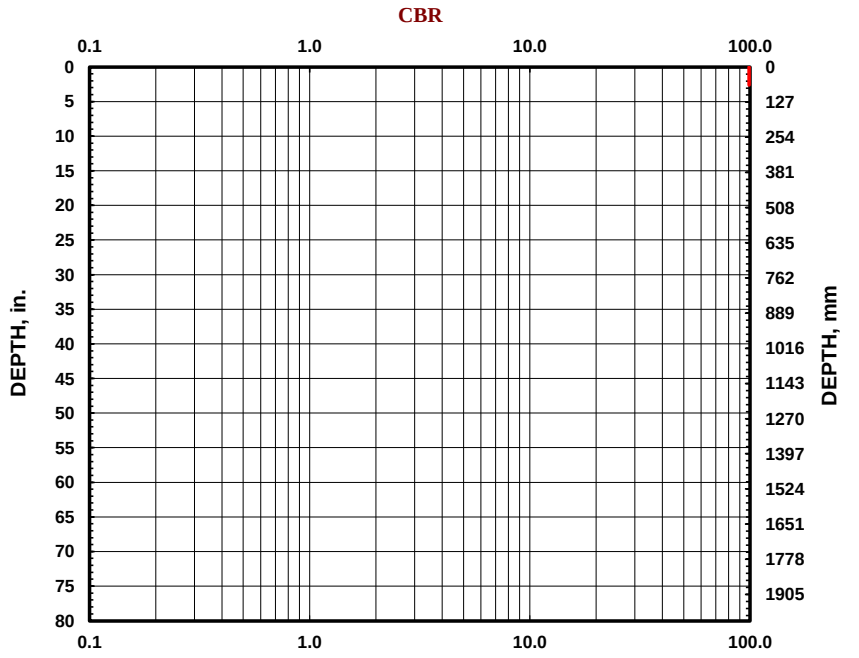
DCP TEST DATA

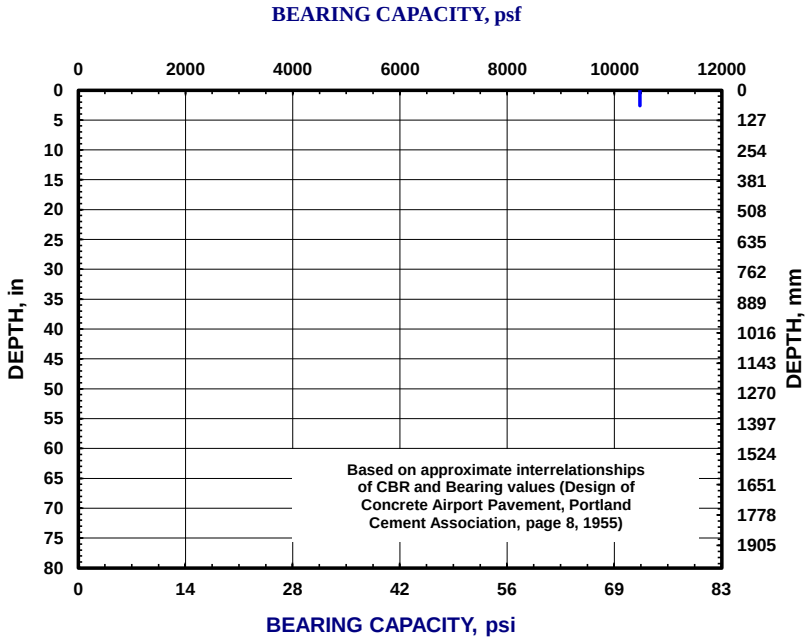
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-010-1-25	**Date:**	2/26/2025
Surface Elev:	962.5	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.110744; -80.827478	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	66.04	1





DCP TEST DATA

Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-011-1-25	**Date:**	2/26/2025
Surface Elev:	953.2	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.111068; -80.823805	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
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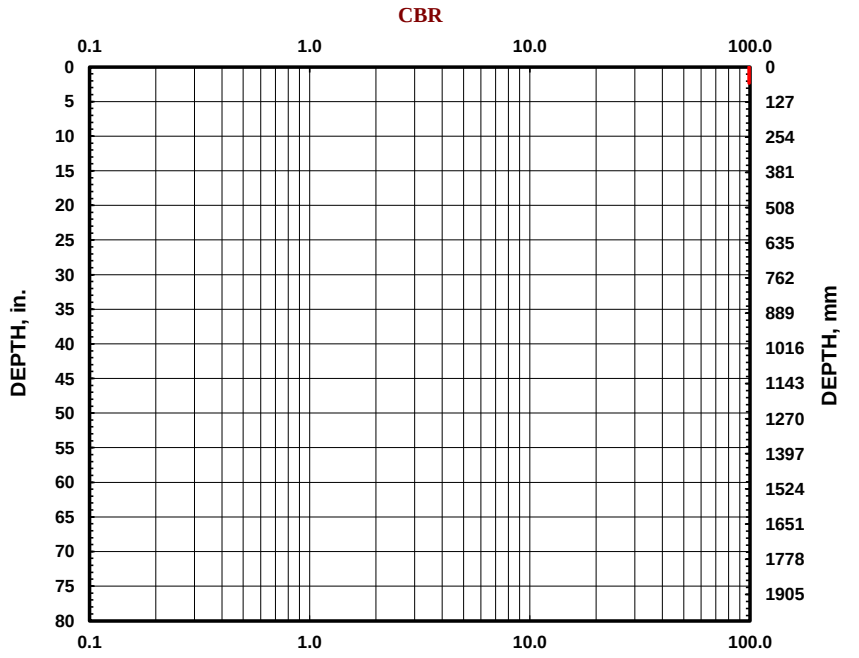
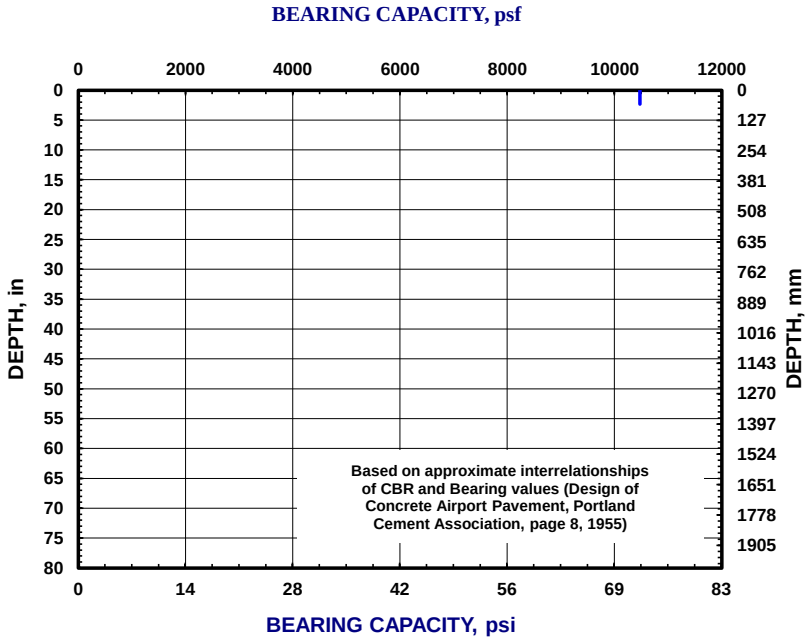
50	58.42	1





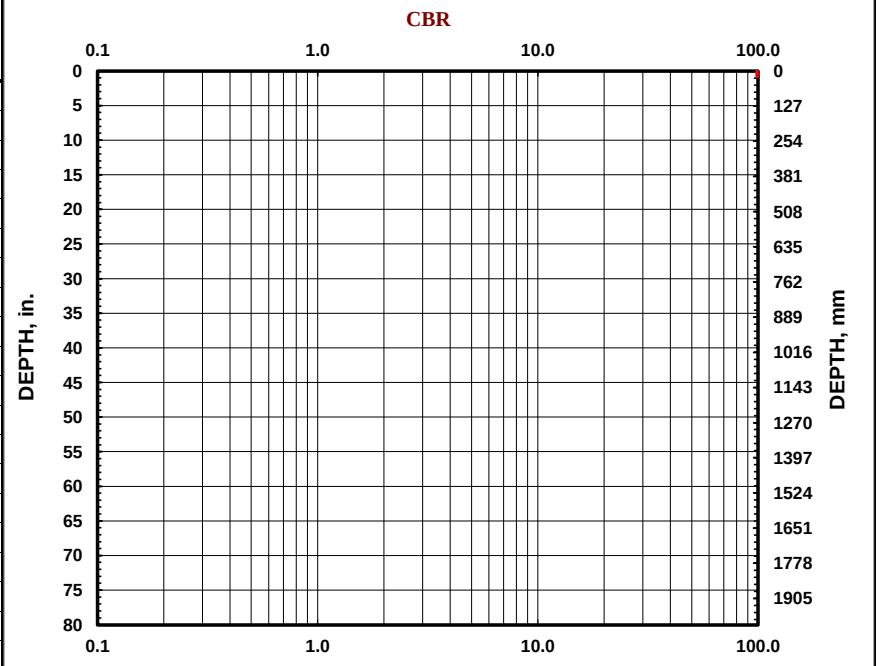
DCP TEST DATA

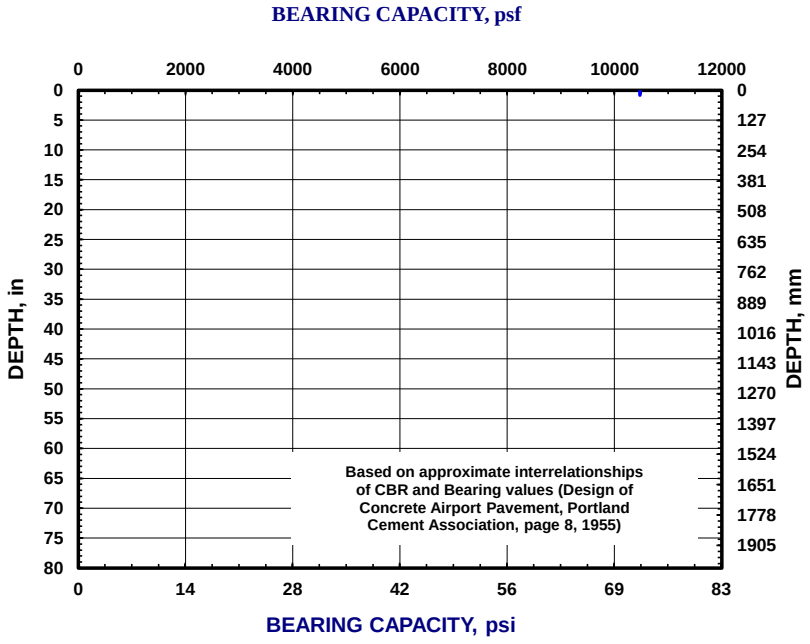
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-012-1-25	**Date:**	2/25/2025
Surface Elev:	937.1	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.111671; -80.820311	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	20.32	1





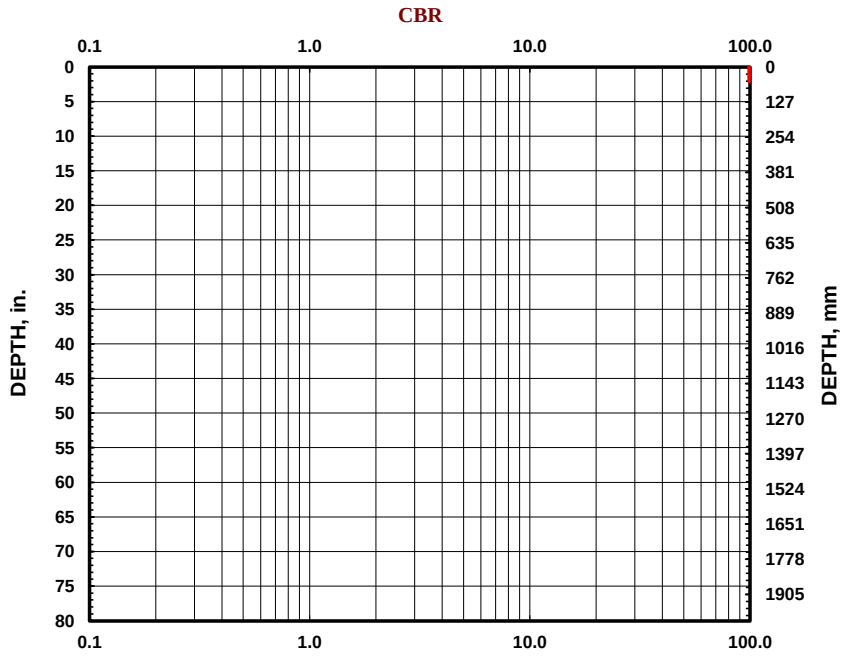
DCP TEST DATA

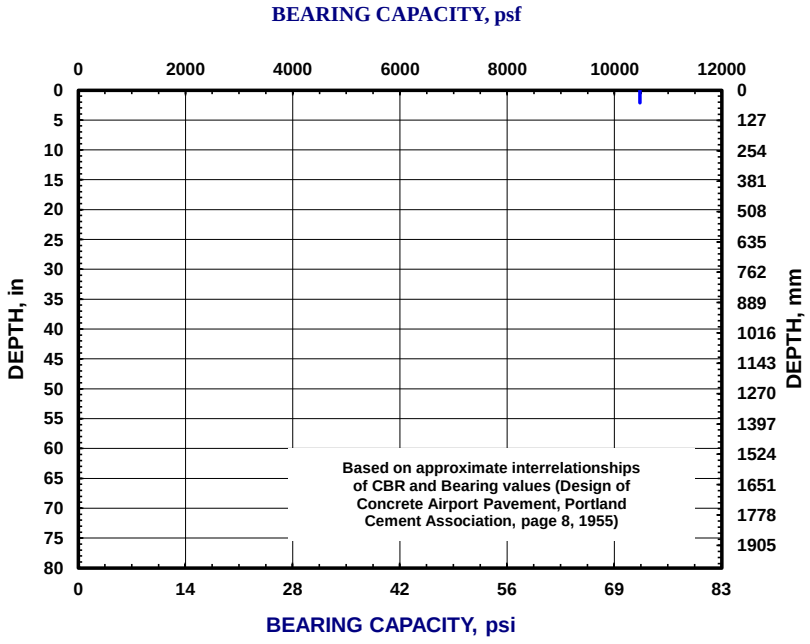
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-013-1-25	**Date:**	2/26/2025
Surface Elev:	920.4	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.111623; -80.816507	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	53.34	1





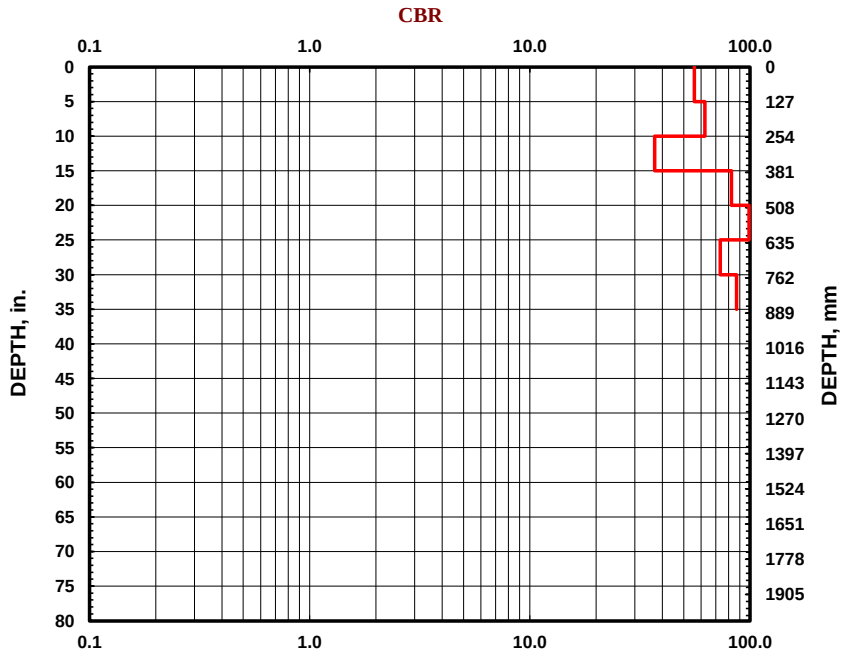
DCP TEST DATA

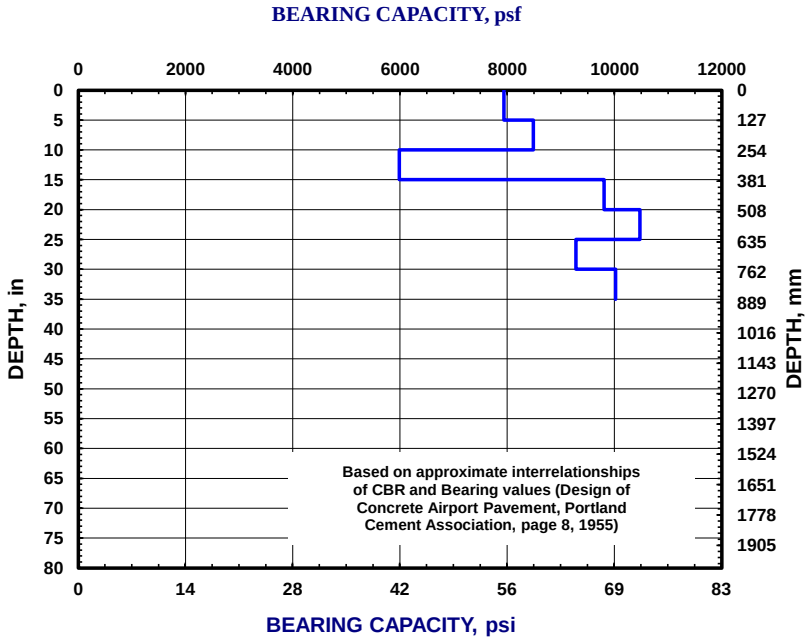
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-014-1-25	**Date:**	2/26/2025
Surface Elev:	921.5	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.115109; -80.805769	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
29	127	1
32	254	1
20	381	1
41	508	1
62	635	1
37	762	1
43	889	1





DCP TEST DATA

Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-015-1-25	**Date:**	2/25/2025
Surface Elev:	917	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.116721; -80.802776	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
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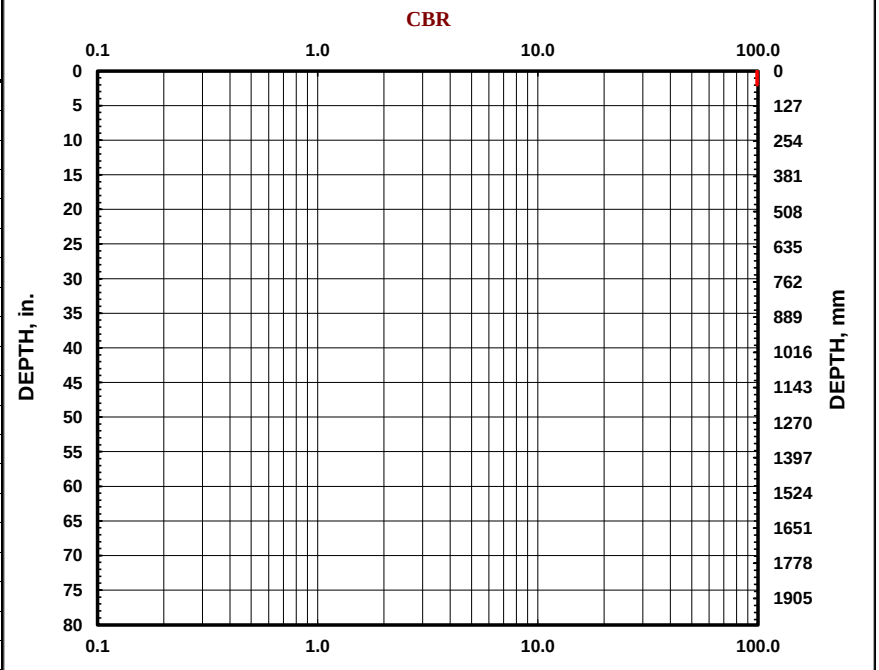
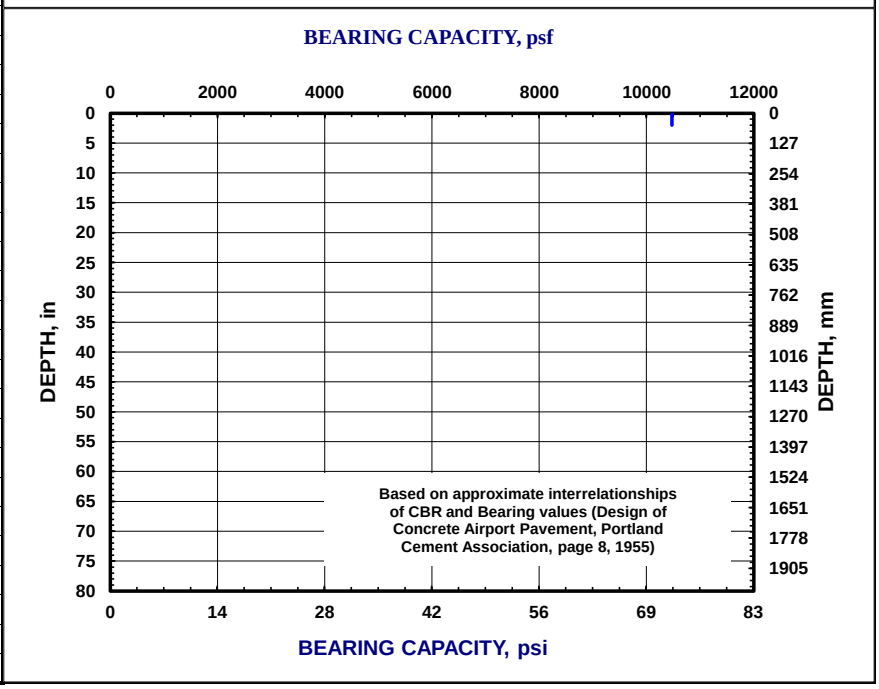
50	50.8	1





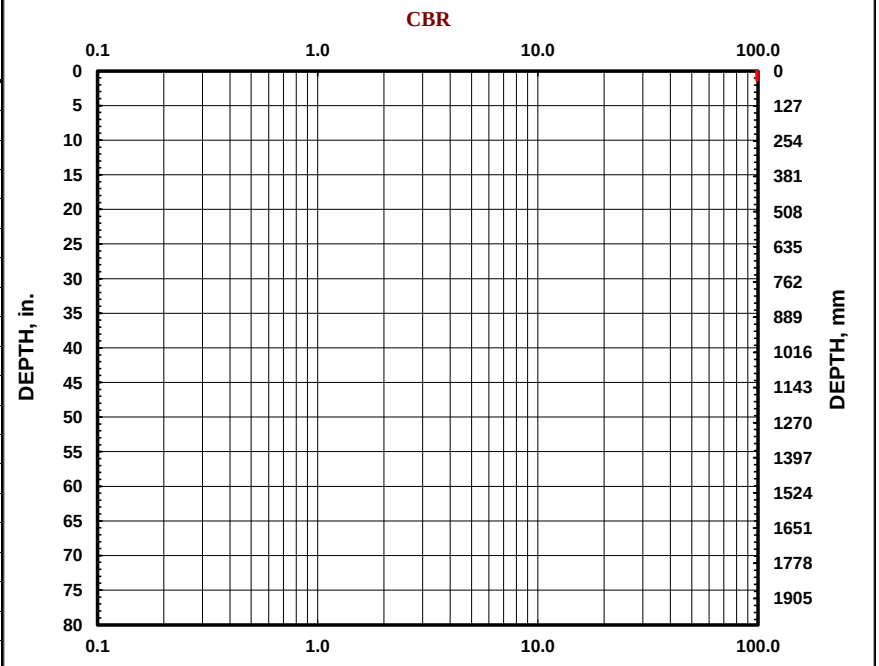
DCP TEST DATA

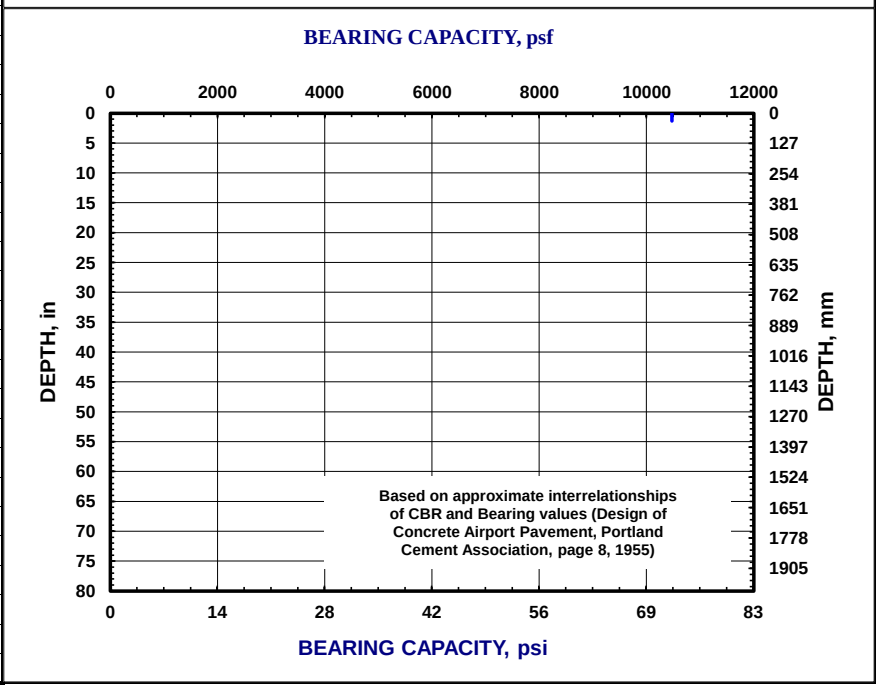
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-016-1-25	**Date:**	2/26/2025
Surface Elev:	920.5	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.117758; -80.799377	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	33.02	1





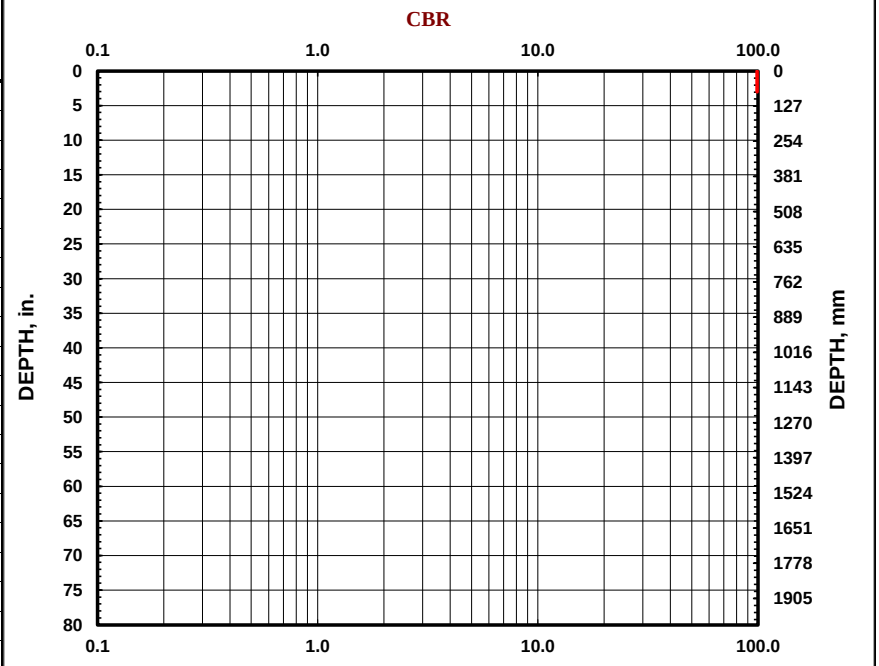
DCP TEST DATA

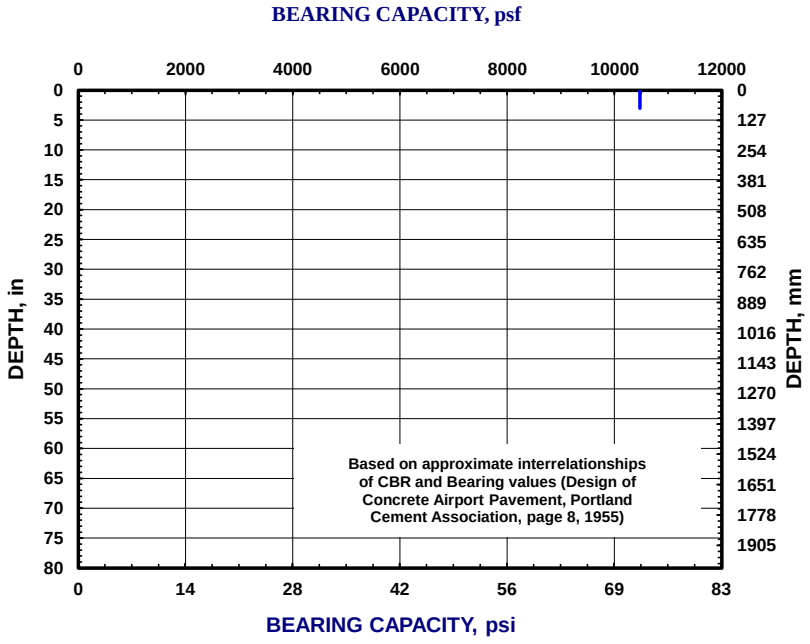
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-017-1-25	**Date:**	2/26/2025
Surface Elev:	934.2	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.119040; -80.796147	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	76.2	1





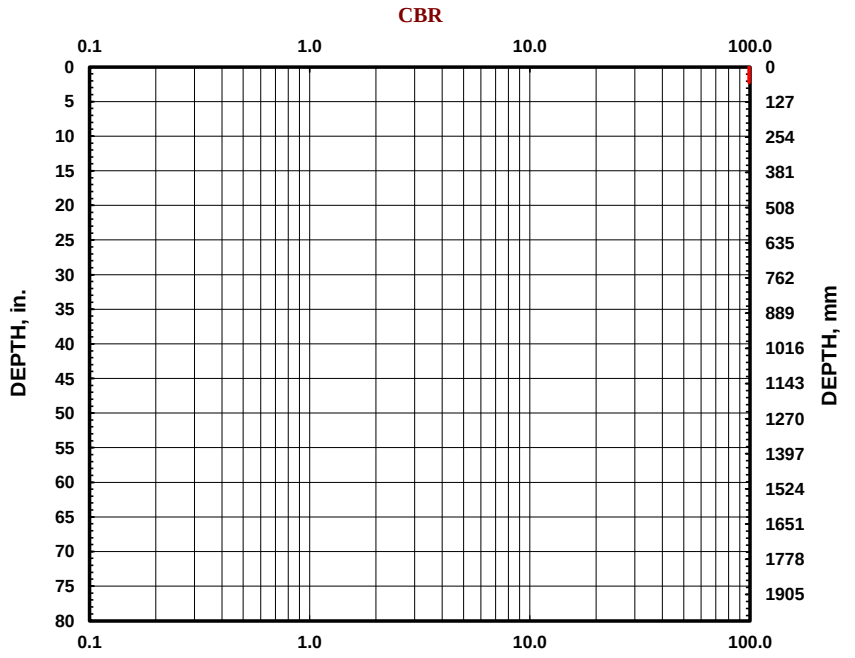
DCP TEST DATA

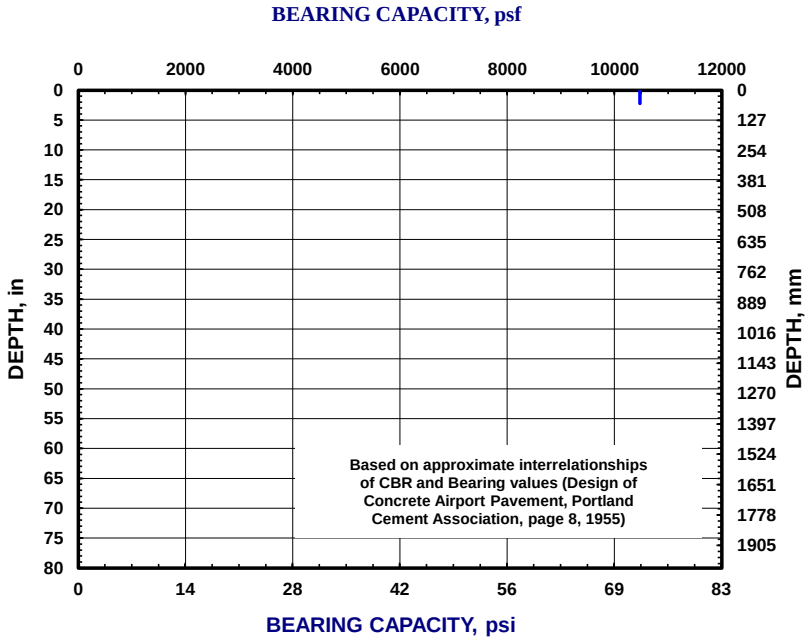
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-018-1-25	**Date:**	2/25/2025
Surface Elev:	952.5	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.120619; -80.792904	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	55.88	1





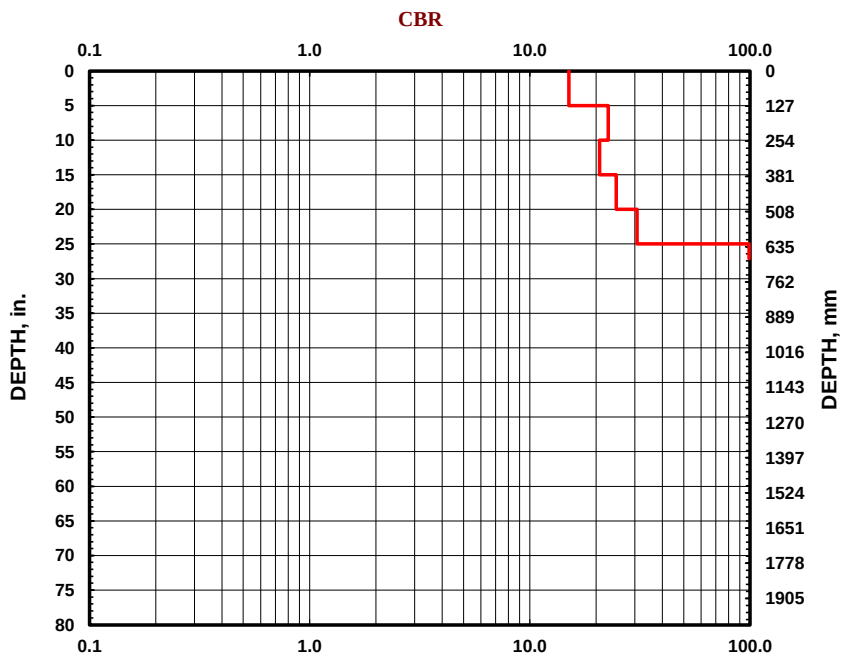
DCP TEST DATA

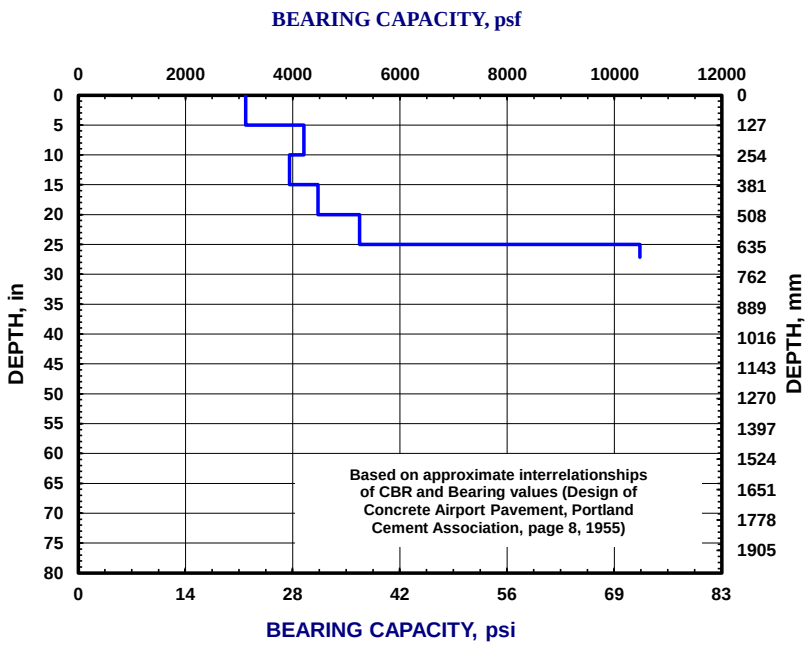
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-019-1-25	**Date:**	2/27/2025
Surface Elev:	968.9	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.121556; -80.789799	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
9	127	1
13	254	1
12	381	1
14	508	1
17	635	1
50	688.34	1





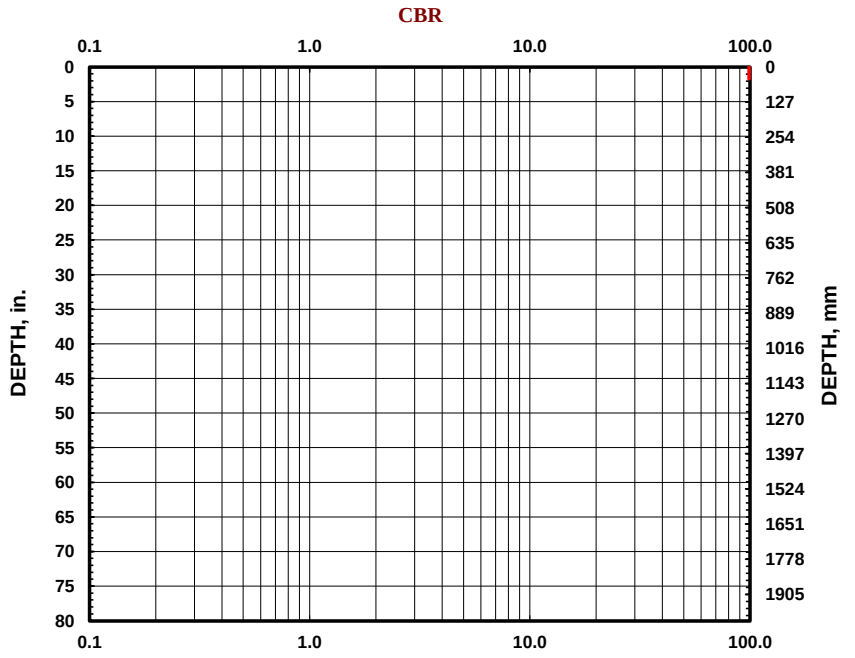
DCP TEST DATA

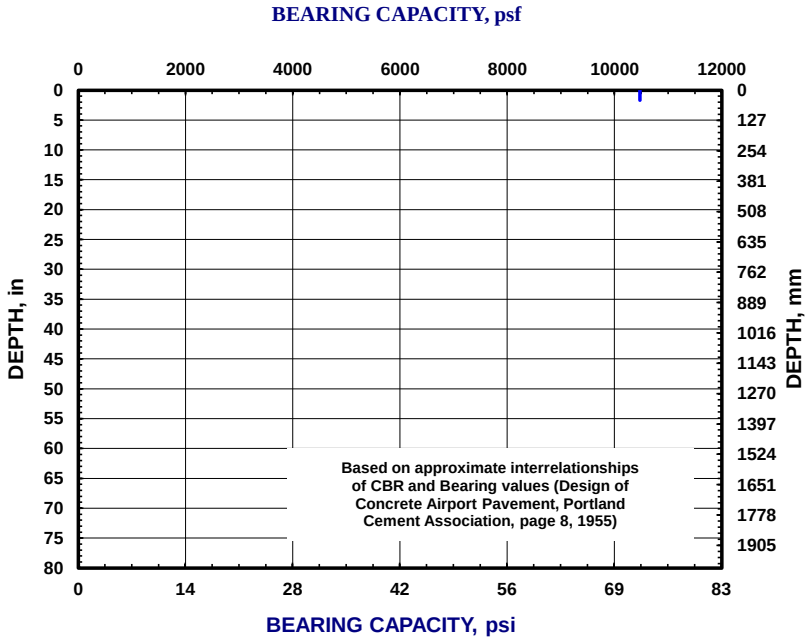
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-020-1-25	**Date:**	2/27/2025
Surface Elev:	998.2	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.122651; -80.786401	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	43.18	1





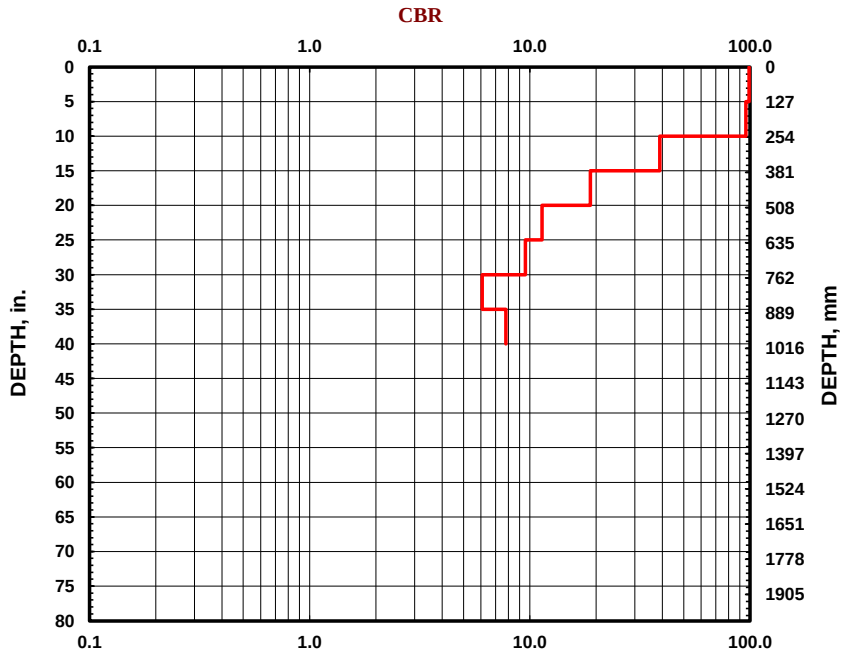
DCP TEST DATA

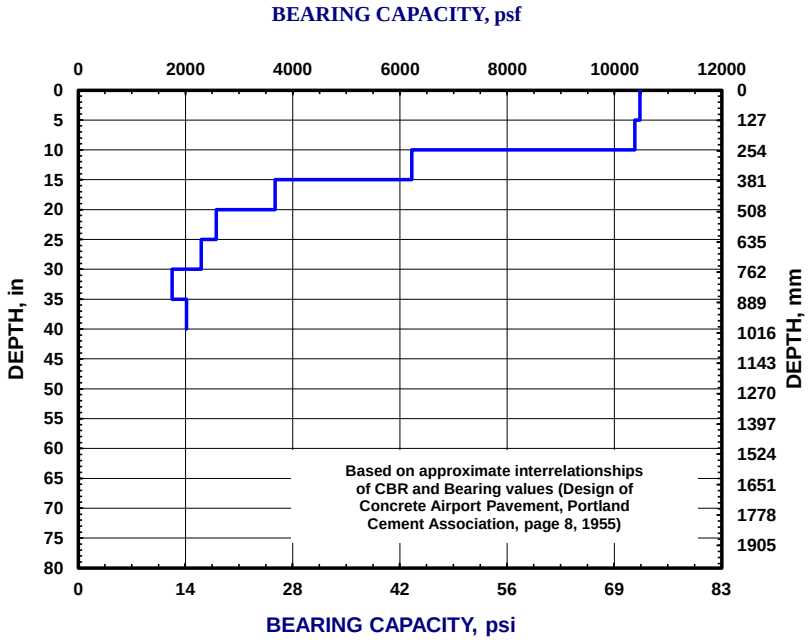
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-021-1-25	**Date:**	2/25/2025
Surface Elev:	1029.3	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.123619; -80.782926	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
51	127	1
47	254	1
21	381	1
11	508	1
7	635	1
6	762	1
4	889	1
5	1016	1





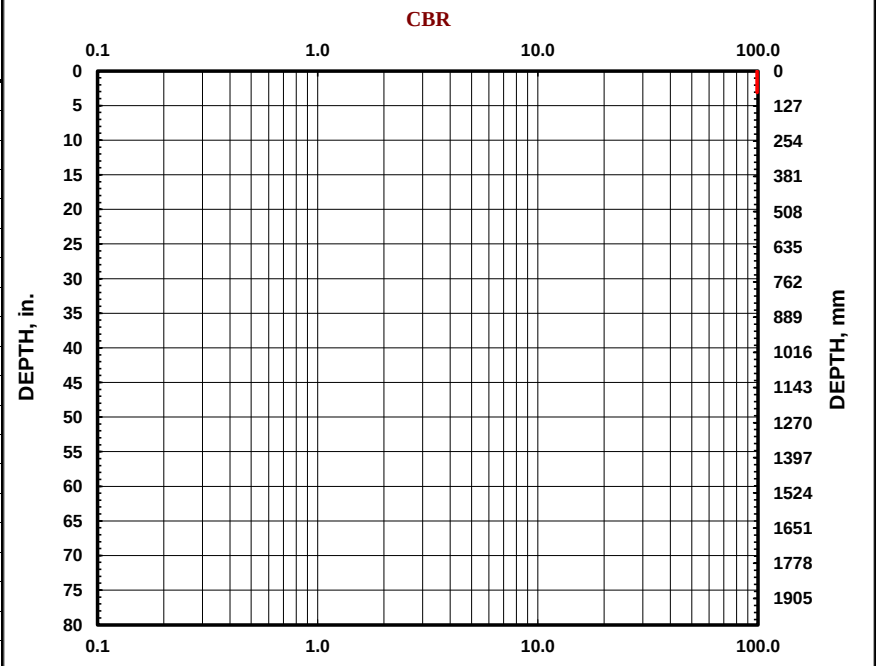
DCP TEST DATA

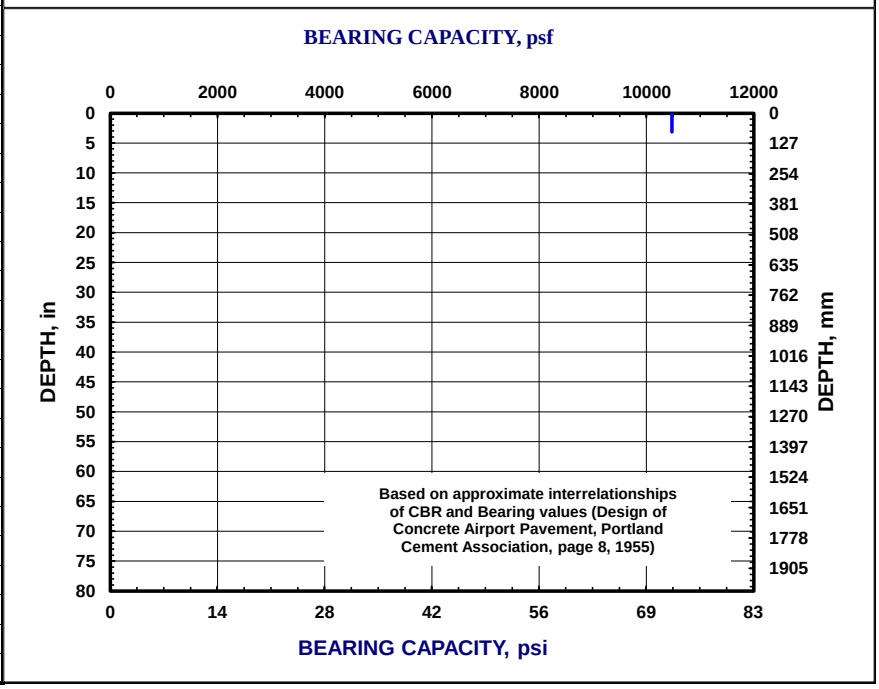
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-022-1-25	**Date:**	2/27/2025
Surface Elev:	1046.4	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.123694; -80.779254	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	78.74	1





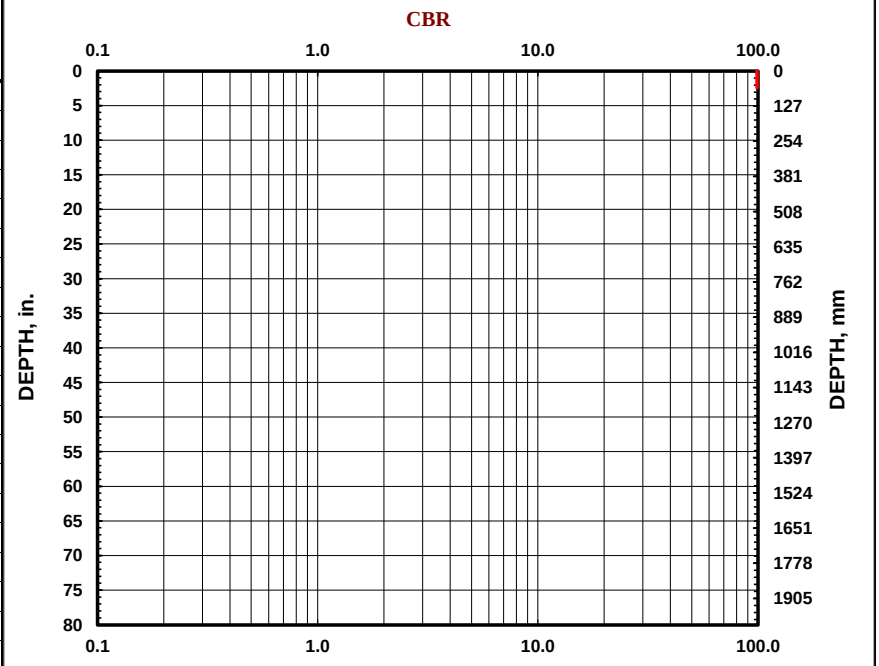
DCP TEST DATA

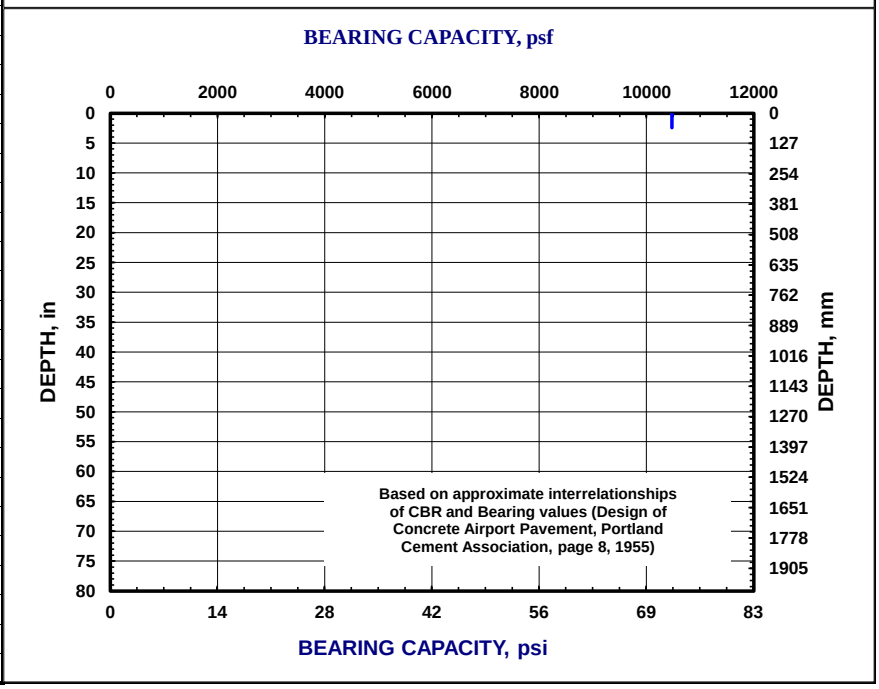
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-023-1-25	**Date:**	2/27/2025
Surface Elev:	1048.2	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.123724; -80.775662	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	60.96	1





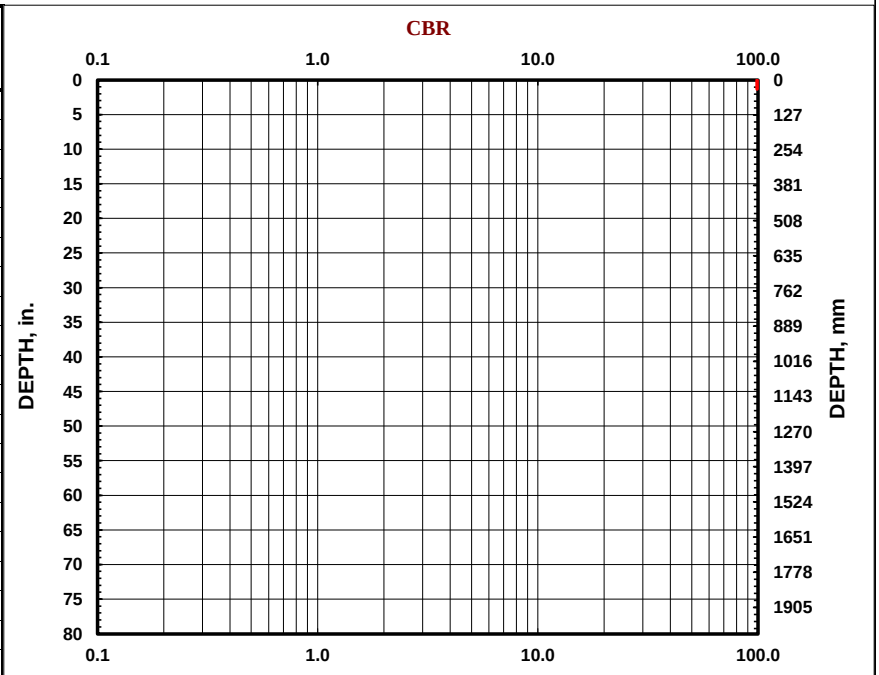
DCP TEST DATA

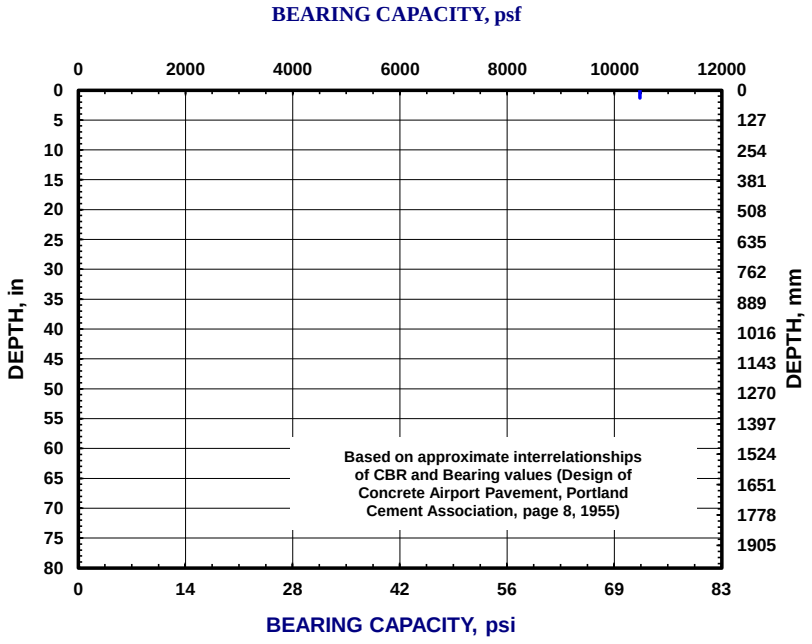
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-024-1-25	**Date:**	2/24/2025
Surface Elev:	1033.7	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.123990; -80.772038	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	33.02	1





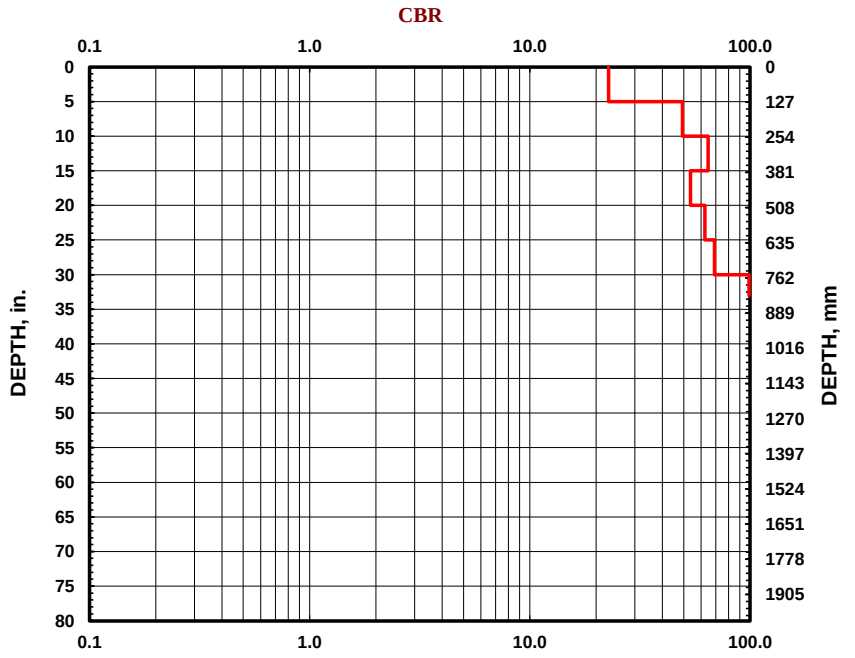
DCP TEST DATA

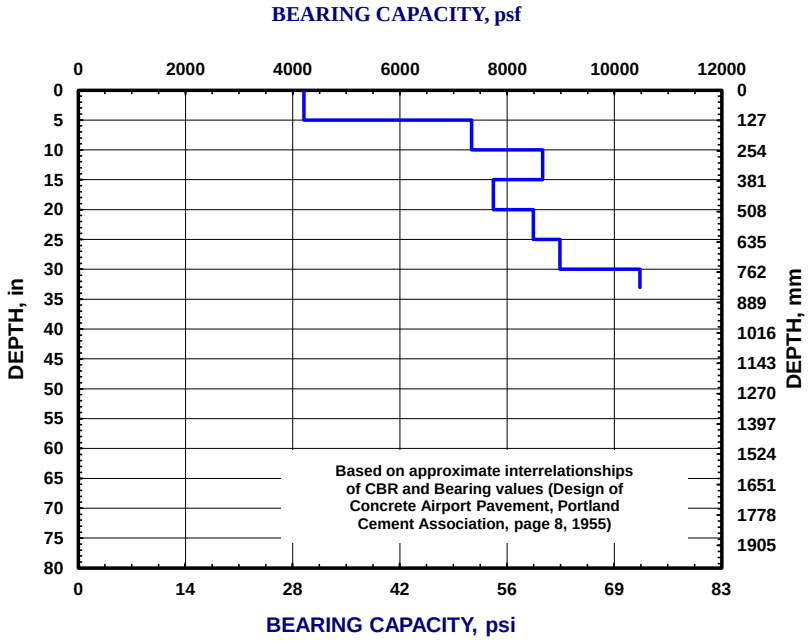
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-025-1-25	**Date:**	2/27/2025
Surface Elev:	1030.5	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.123742; -80.768731	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
13	127	1
26	254	1
33	381	1
28	508	1
32	635	1
35	762	1
50	838.2	1





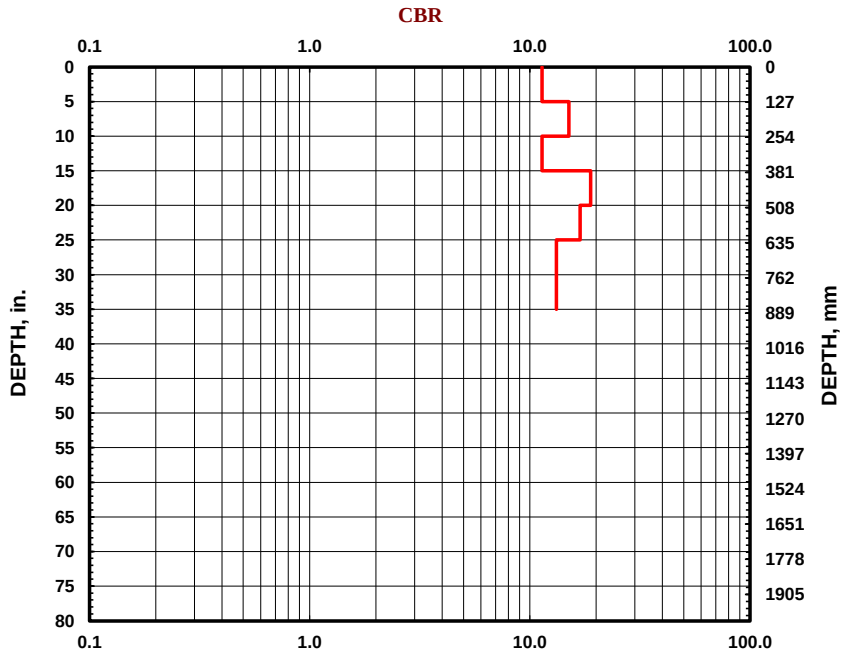
DCP TEST DATA

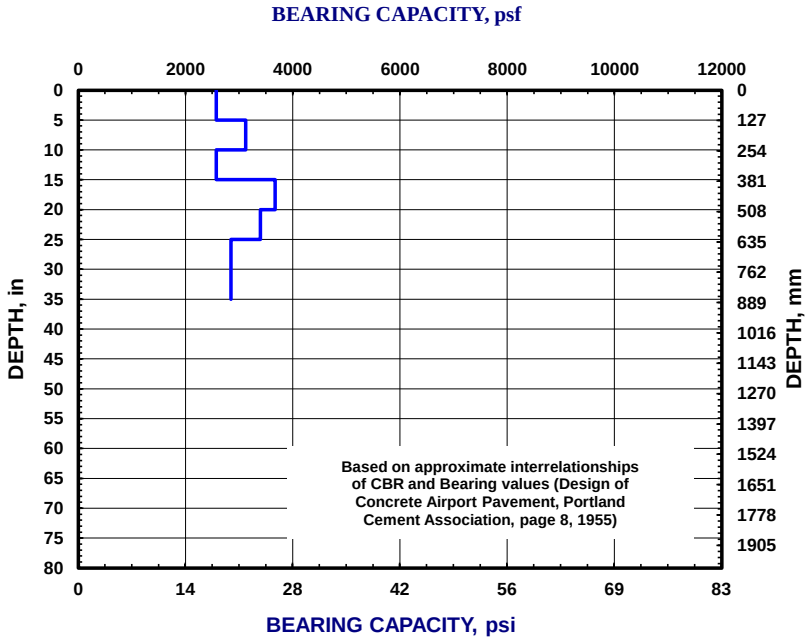
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-026-1-25	**Date:**	2/27/2025
Surface Elev:	1039.2	**Surface Materials:**	Asphalt/Granular Base
Lat / Long:	41.123751; -80.765833	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
7	127	1
9	254	1
7	381	1
11	508	1
10	635	1
8	762	1
8	889	1





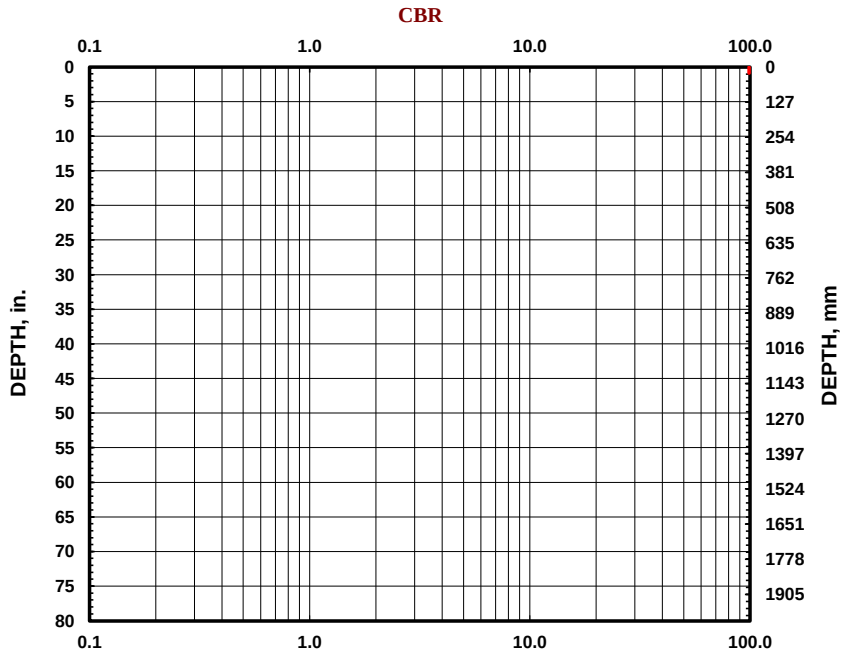
DCP TEST DATA

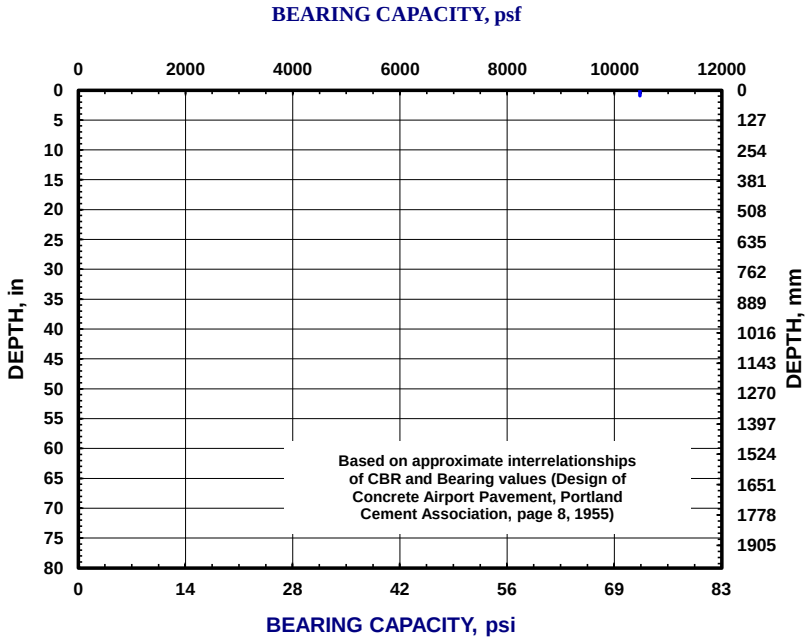
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-027-1-25	**Date:**	2/24/2025
Surface Elev:	1061.3	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.124229; -80.758246	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	22.86	1





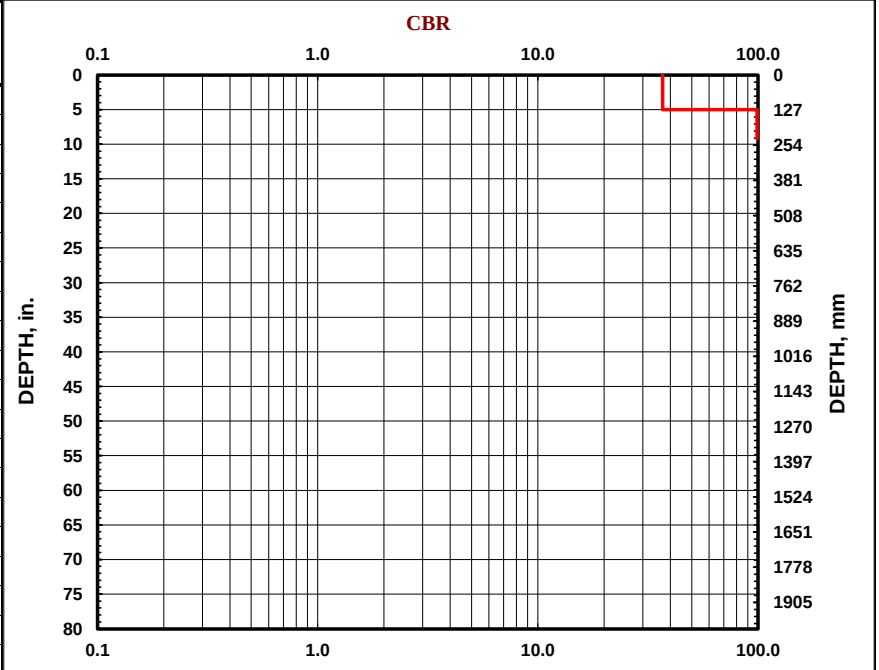
DCP TEST DATA

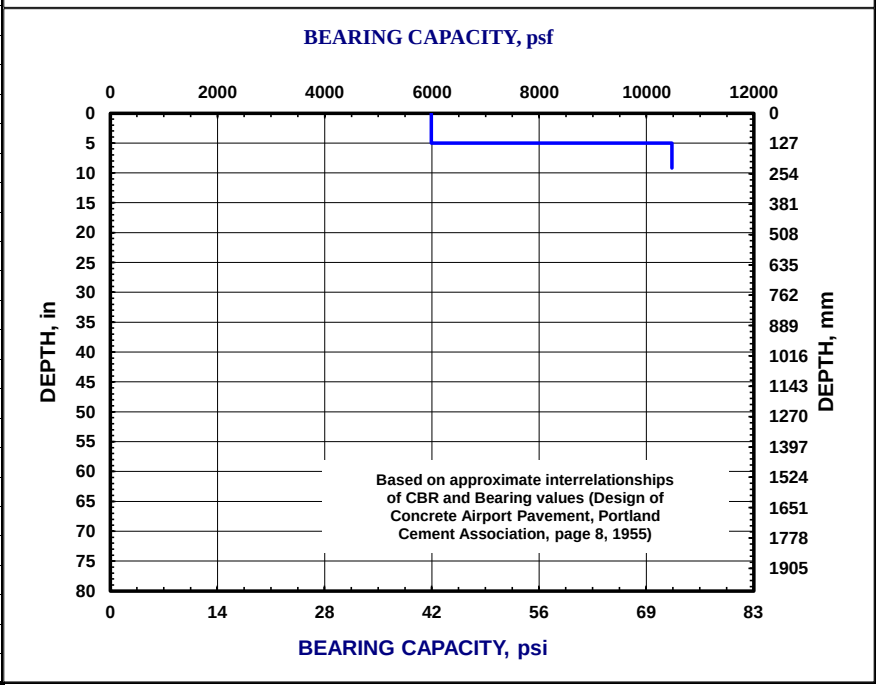
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-028-1-25	**Date:**	2/24/2025
Surface Elev:	1054.4	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.126040; -80.751561	**Test Starting Depth:**	2.0

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
20	127	1
50	233.68	1





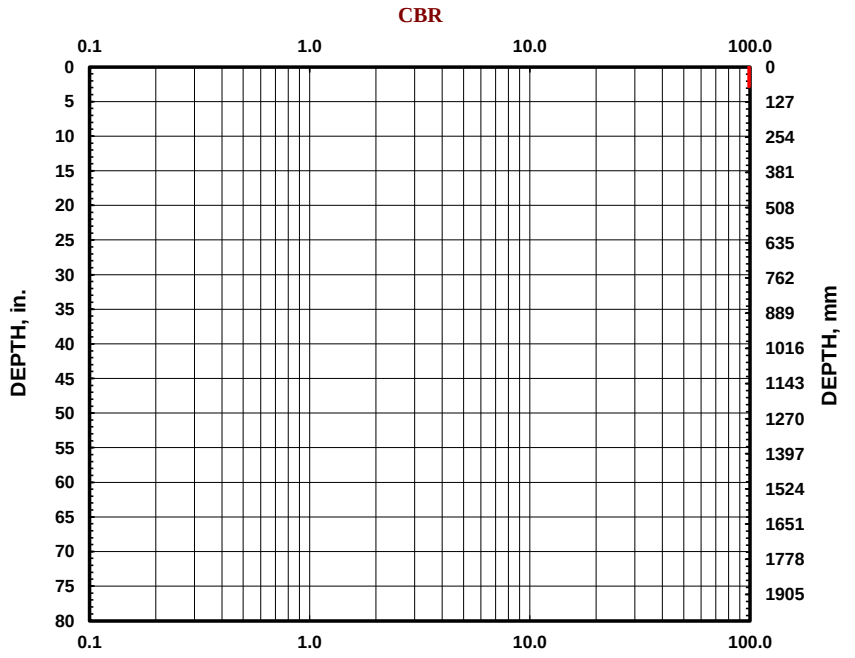
DCP TEST DATA

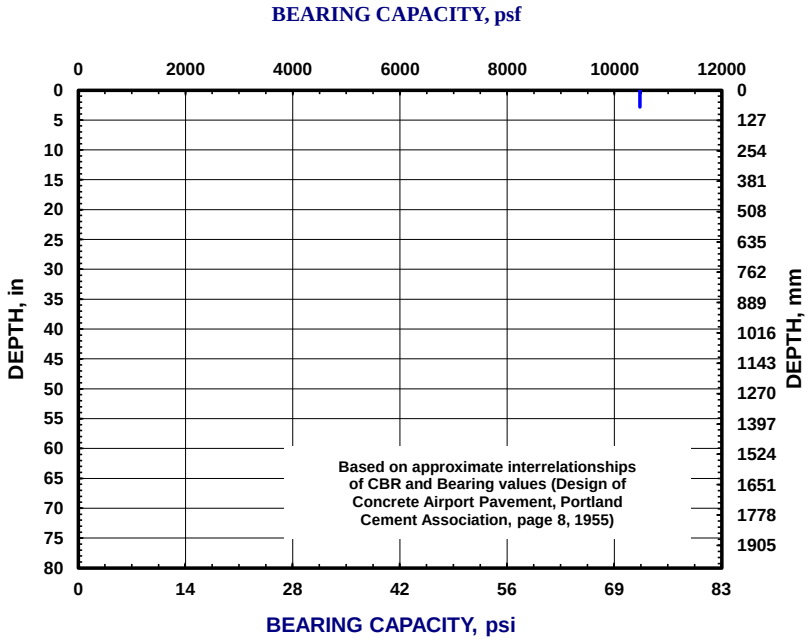
Project:	MAH-76/80-8.50/0.00	**PID:**	122947
Exploration ID:	D-029-1-25	**Date:**	2/24/2025
Surface Elev:	1049.3	**Surface Materials:**	Concrete/Granular Base
Lat / Long:	41.129300; -80.746298	**Test Starting Depth:**	2.3

Hammer
- ○ 10.1 lbs.
- ○ 17.6 lbs.
- ◉ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
50	71.12	1





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Cincinnati, Ohio 45242
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Fax Number: (513) 769-7055

PROJECT	MAH-76 80-8.50 0.00
JOB NO.	N-25-003
DATE TESTED	3/18/2025-3/26/2025
TESTED BY	EM/KL

DETERMINING SULFATE CONTENT IN SOILS
COLORIMETRIC METHOD
ODOT SUPPLEMENT 1122

Boring	Sample	SAMPLE DATE	State Plane Coordinates		Elevation	Soaking Time (hr)	Dilution Ratio	Replicate Sample Readings			Average Reading	Sulfate Content (ppm)
			Northing	Easting				1	2	3		
B-004-0	S-2X (3.5'-5.0')	2/25/25			3.5'-5.0'	24	20	7	6	6	6.33	152
B-005-0	S-2X (3.5'-5.0')	2/28/25			3.5'-5.0'	24	20	40	41	41	40.67	976
B-010-0	S-2X (3.5'-5.0')	2/26/25			3.5'-5.0'	24	20	40	41	41	40.67	976
B-010-0	S-3X (5.0'-5.8')	2/26/25			5.0'-5.8'	24	20	23	24	24	23.67	568
B-011-0	S-2X (3.5'-5.0')	2/26/25			3.5'-5.0'	24	20	33	33	33	33.00	792
B-011-0	S-3X (5.0'-6.5')	2/26/25			5.0'-6.5'	24	20	10	11	11	10.67	256
B-012-0	S-2XB (4.2'-5.0')	2/25/25			4.2'-5.0'	24	20	9	10	10	9.67	232
B-012-0	S-3X (5.0'-6.5')	2/25/25			5.0'-6.5'	24	20	7	8	8	7.67	184
B-013-0	S-2X (3.5'-5.0')	2/26/25			3.5'-5.0'	24	20	11	11	11	11.00	264
B-013-0	S-3X (5.0'-6.5')	2/26/25			5.0'-6.5'	24	20	32	33	33	32.67	784
B-014-0	S-2X (3.0'-5.0')	2/26/25			3.5'-5.0'	24	20	39	40	40	39.67	952
B-014-0	S-3X (5.0'-6.5')	2/26/25			5.0'-6.5'	24	20	37	38	38	37.67	904
B-015-0	S-2X (3.5'-5.0')	2/25/25			3.5'-5.0'	24	20	42	43	43	42.67	1024
B-015-0	S-3X (5.0'-6.5')	2/25/25			5.0'-6.5'	24	20	46	46	46	46.00	1104
B-016-0	S-2X (3.5'-5.0')	2/26/25			3.5'-5.0'	24	20	14	15	15	14.67	352
B-016-0	S-3X (5.0'-6.2')	2/26/25			5.0'-6.2'	24	20	10	10	10	10.00	240
B-017-0	S-2X (3.5'-5.0')	2/26/25			3.5'-5.0'	24	20	9	10	10	9.67	232
B-017-0	S-3X (5.0'-6.2')	2/26/25			5.0'-6.5'	24	20	24	24	24	24.00	576
B-018-0	S-2X (3.5'-5.0')	2/25/25			3.5'-5.0'	24	20	35	36	36	35.67	856
B-019-0	S-2X (3.5'-4.4')	2/27/25			3.5'-4.4'	24	20	17	17	17	17.00	408
B-019-0	S-4X (6.5'-8.0')	2/27/25			6.5'-8.0'	24	20	24	24	24	24.00	576
B-020-0	S-2X (3.5'-5.0')	2/27/25			3.5'-5.0'	24	20	25	26	26	25.67	616
B-020-0	S-3X (5.0'-6.5')	2/27/25			5.0'-6.5'	24	20	18	18	18	18.00	432

Corporate Office
6350 Presidential Gateway
Columbus, Ohio 43231
Telephone: (614) 823-4949
Fax Number: (614) 823-4990

Cleveland Office
9885 Rockside Road
Cleveland, OH 44125
Telephone (216) 573-0955
Fax Number: (216) 573-0963

Cincinnati Office
4480 Lake Forest Drive
Cincinnati, Ohio 45242
Telephone (513) 769-6998
Fax Number: (513) 769-7055

PROJECT	MAH-76 80-8.50 0.00
JOB NO.	N-25-003
DATE TESTED	3/18/2025-3/26/2025
TESTED BY	EM/KL

DETERMINING SULFATE CONTENT IN SOILS
COLORIMETRIC METHOD
ODOT SUPPLEMENT 1122

Boring	Sample	SAMPLE DATE	State Plane Coordinates		Elevation	Soaking Time (hr)	Dilution Ratio	Replicate Sample Readings			Average Reading	Sulfate Content (ppm)
			Northing	Easting				1	2	3		
B-021-0	S-2X (3.5'-5.0')	2/25/25			3.5'-5.0'	24	20	7	7	7	7.00	168
B-021-0	S-3X (5.0'-6.5')	2/25/25			5.0'-6.5'	24	20	13	14	14	13.67	328
B-022-0	S-2X (3.5'-5.0')	2/27/25			3.5'-5.0'	24	20	10	10	10	10.00	240
B-022-0	S-3X (5.0'-6.5')	2/27/25			5.0'-6.5'	24	20	13	13	13	13.00	312
B-002-0	S-2X (3.5'-4.4')	2/25/25			3.5'-4.4'	24	20	25	25	25	25.00	600
B-006-0	S-2X (3.5'-4.8')	2/25/25			3.5'-4.8'	24	20	56	56	56	56.00	1344
B-009-0	S-1B (2.9'-3.1')	2/28/25			2.9'-3.1'	24	20	15	15	15	15.00	360
B-023-0	S-2X (3.5'-5.0')	2/27/25			3.5'-5.0'	24	20	56	57	57	56.67	1360
B-023-0	S-3X (5.0'-6.5')	2/27/25			3.5'-5.0'	24	20	41	41	41	41.00	984
B-024-0	S-2X (3.5'-5.0')	2/24/25			3.5'-5.0'	24	20	60	60	60	60.00	1440
B-024-0	S-3X (5.0'-6.5')	2/24/25			3.5'-5.0'	24	20	52	51	51	51.33	1232
B-026-0	S-2X (5.0'-6.5')	2/27/25			3.5'-5.0'	24	20	11	11	11	11.00	264
B-026-0	S-3X (3.5'-5.0')	2/27/25			3.5'-5.0'	24	20	14	14	14	14.00	336
.B-027-0	S-2X (3.5'-5.0')	2/24/25			3.5'-5.0'	24	20	12	12	12	12.00	288
B-027-0	S-3X (5.0'-6.5')	2/24/25			3.5'-5.0'	24	20	28	28	28	28.00	672
B-028-0	S-2X (3.5'-5.0')	2/24/25			3.5'-5.0'	24	20	16	16	16	16.00	384
B-028-0	S-3X (3.5'-5.0')	2/24/25			3.5'-5.0'	24	20	17	17	17	17.00	408
B-029-0	S-2X (4.0'-5.5')	2/24/25			4.0'-5.5'	24	20	17	18	18	17.67	424
B-029-0	S-3X (5.5'-7.0')	2/24/25			5.5'-7.0'	24	20	17	17	17	17.00	408
B-008-0	S-3 (2.0'-3.3')	2/26/25			2.0'-3.0'	24	20	11	10	10	10.33	248
B-018-0	S-3 (5.0'-6.5')	2/25/25			5.0'-6.5'	24	20	26	26	26	26.00	624
B-025-0	S-2 (3.5'-4.8')	2/28/25			3.5'-4.8'	24	20	8	9	9	8.67	208

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.

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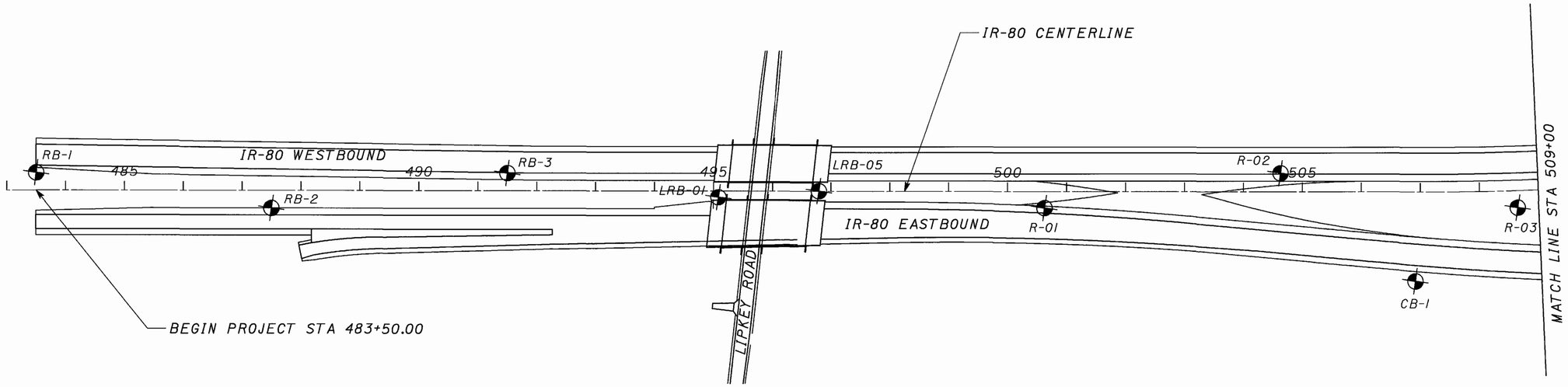
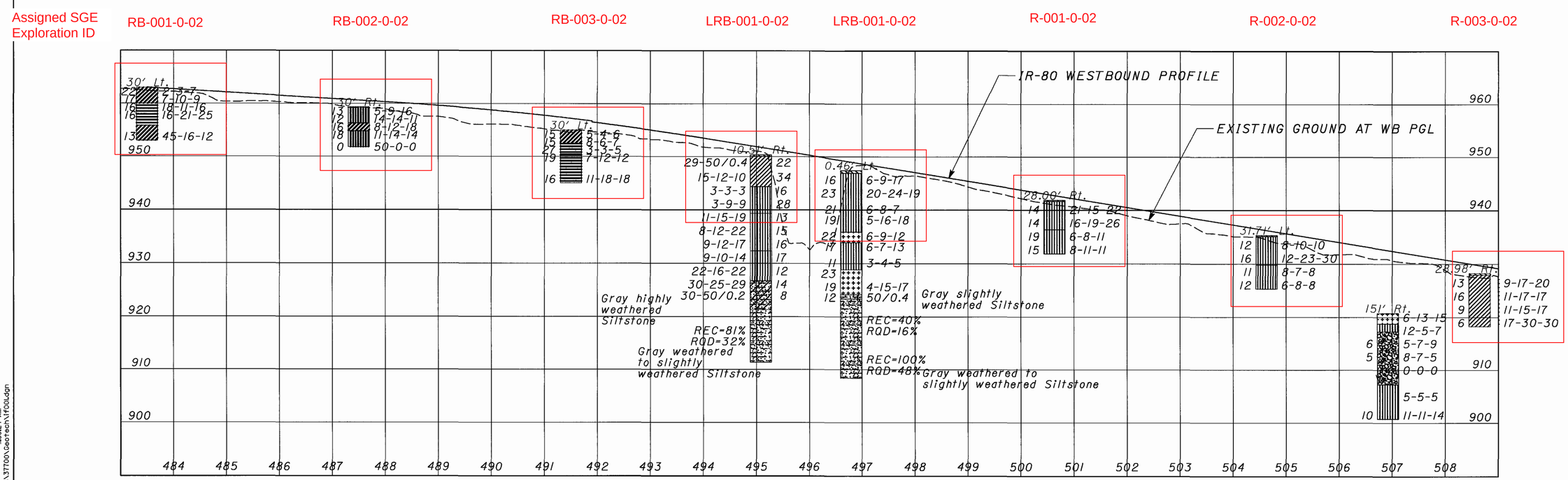
Appendix B – Historic Boring Information





N

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CALCULATED	CHECKED
	S.S.

DATE	REVIEWED	DRAWN
2/04/05	M.W.W.	J.M.T.

ROADWAY SOIL PROFILE
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MAHONING COUNTY
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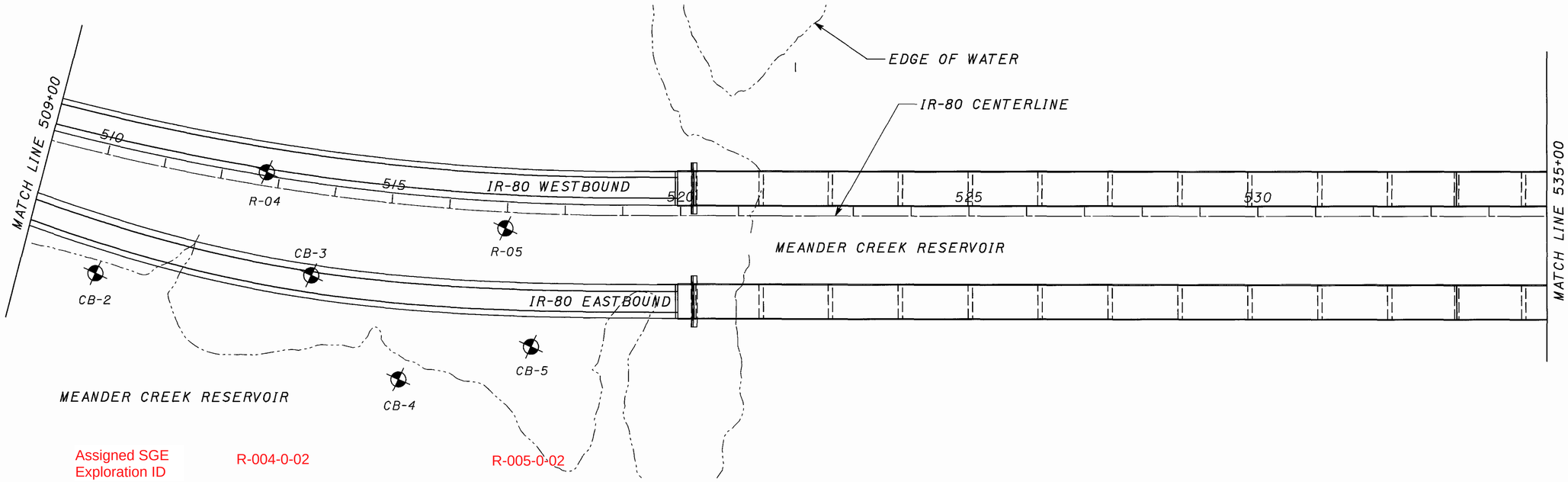

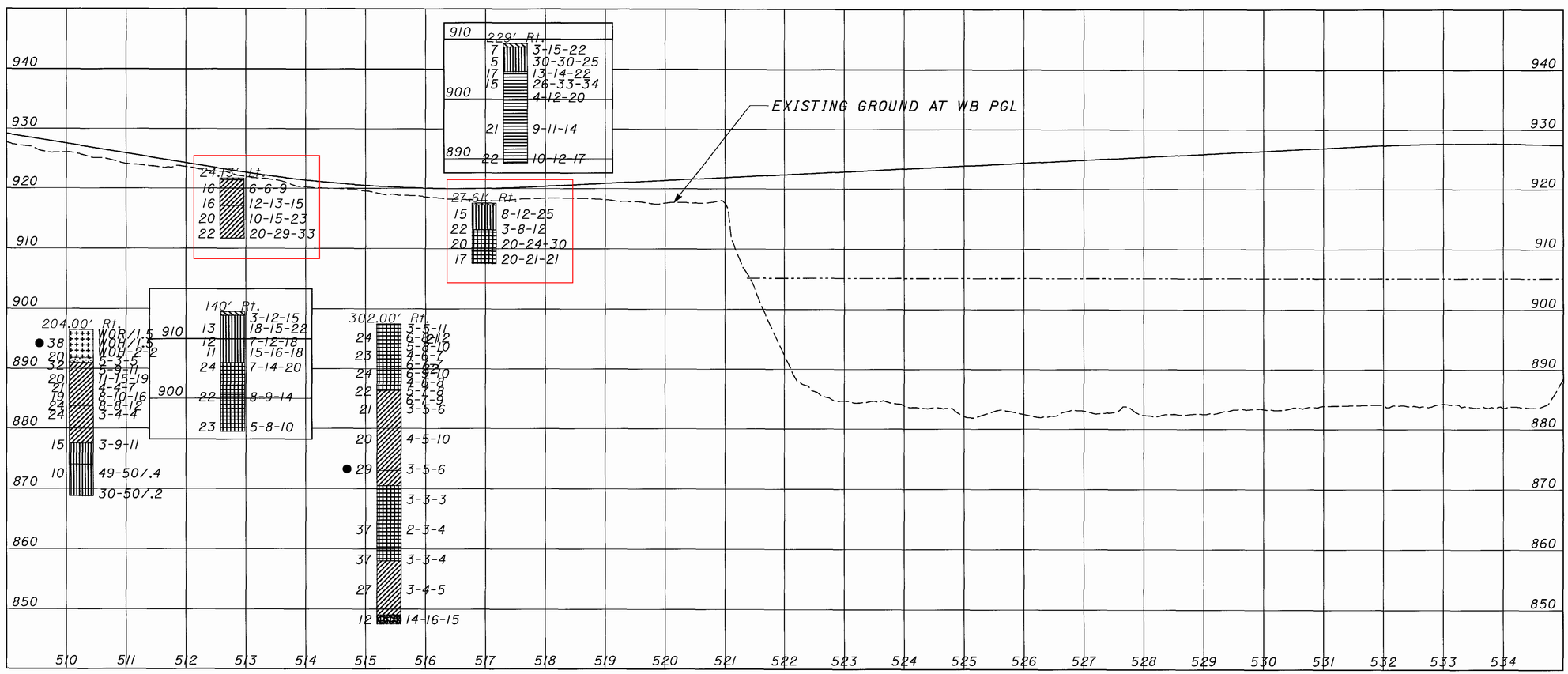

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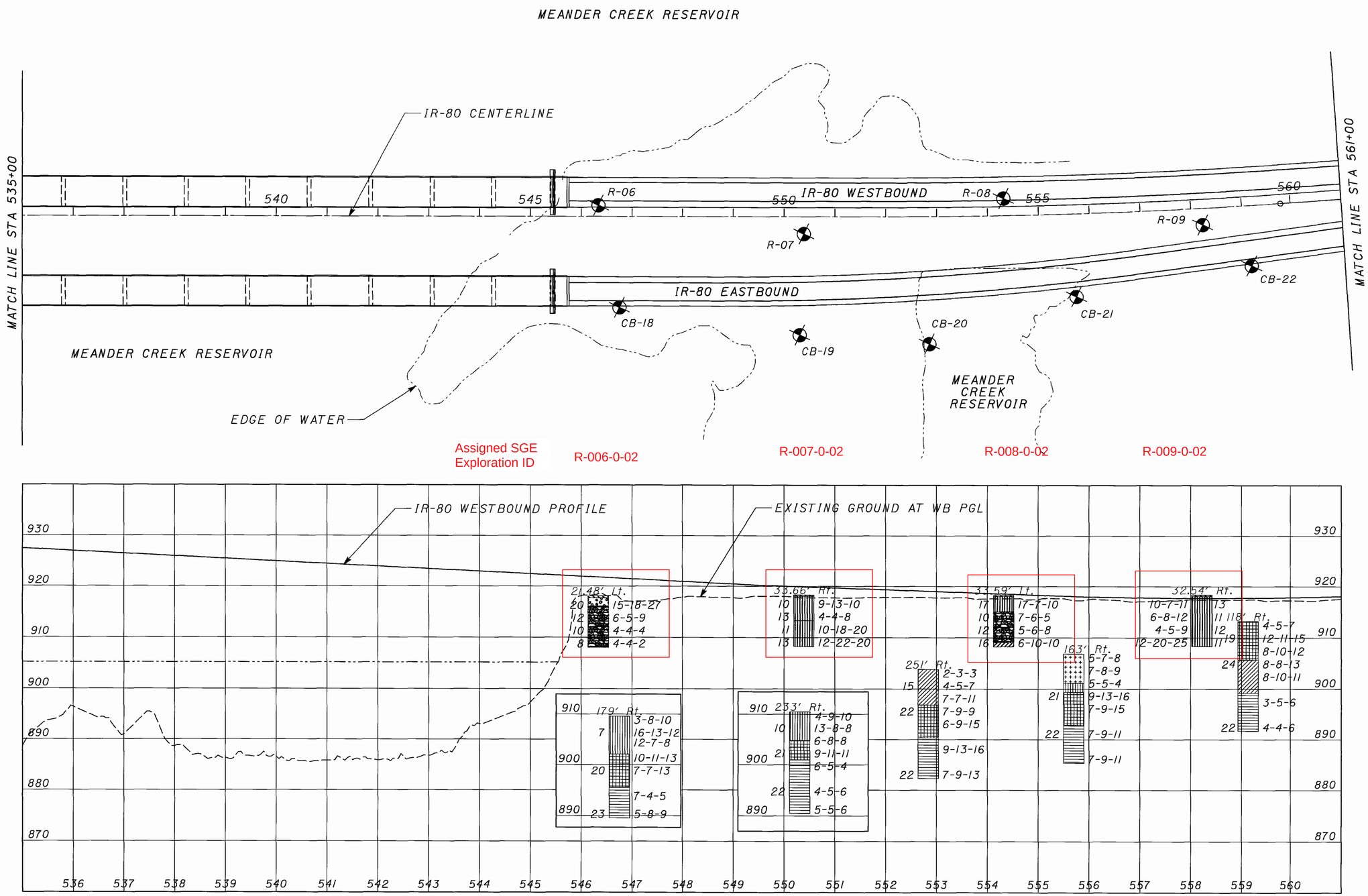

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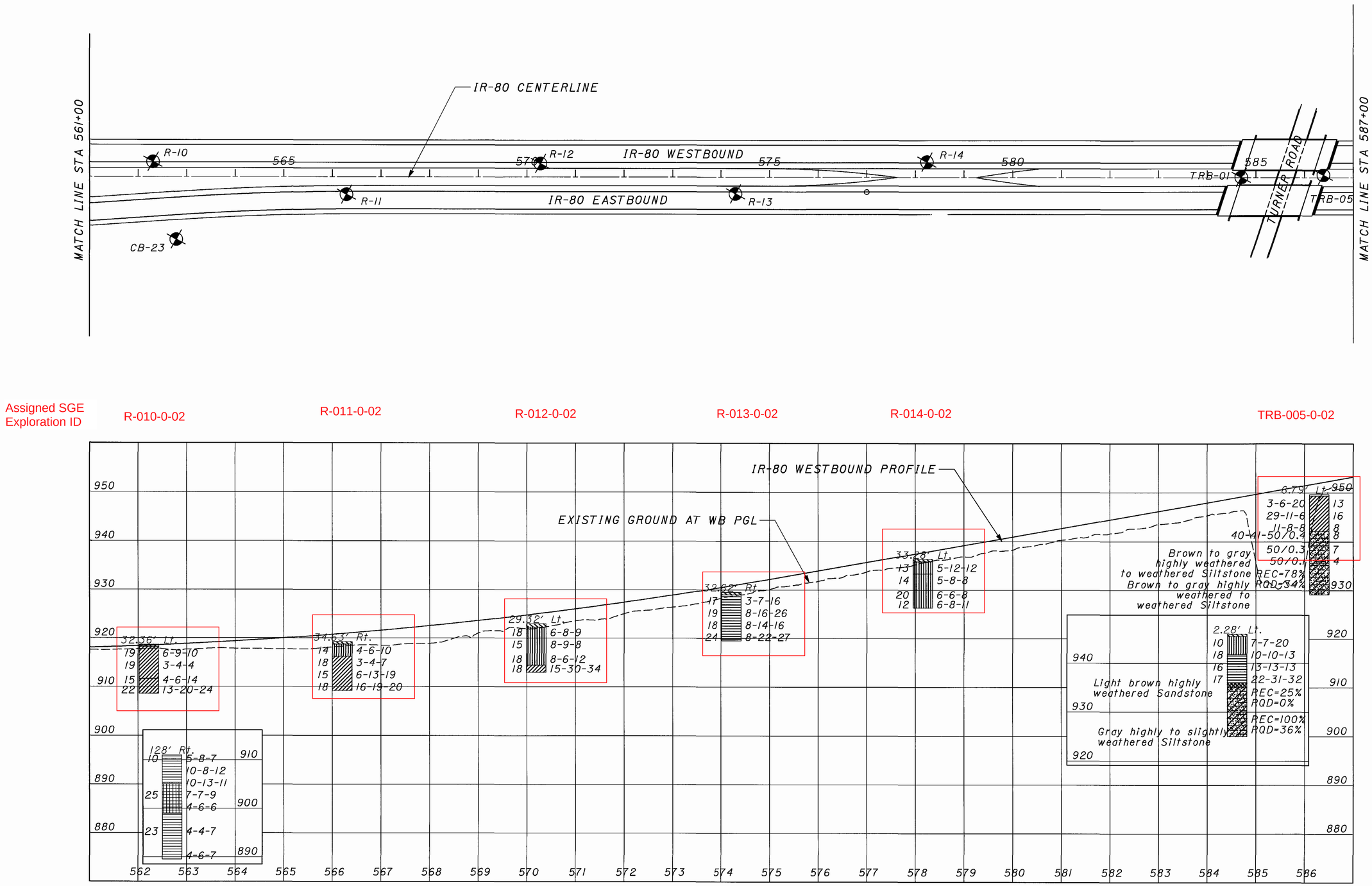

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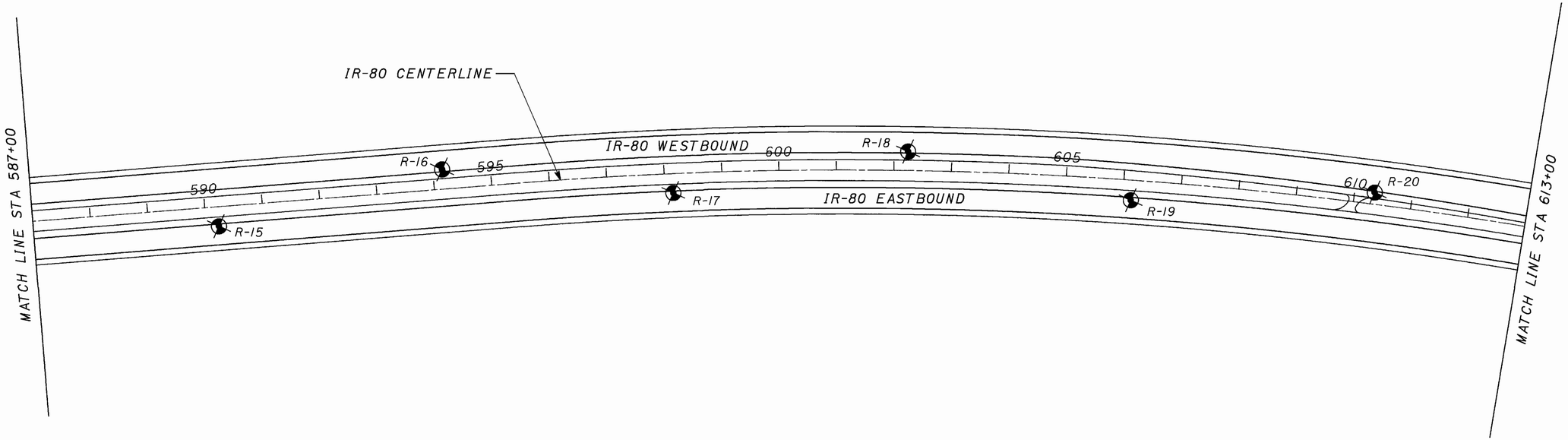

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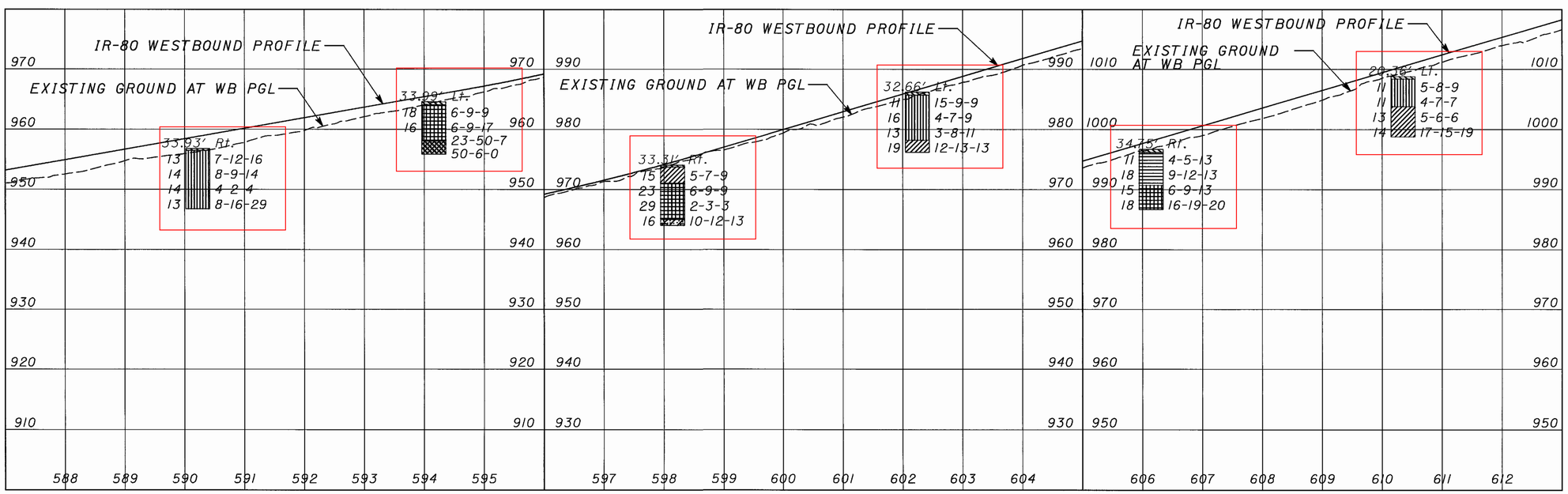

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DATE	REVIEWED	DRAWN
2/04/05	M.W.W.	J.M.T.

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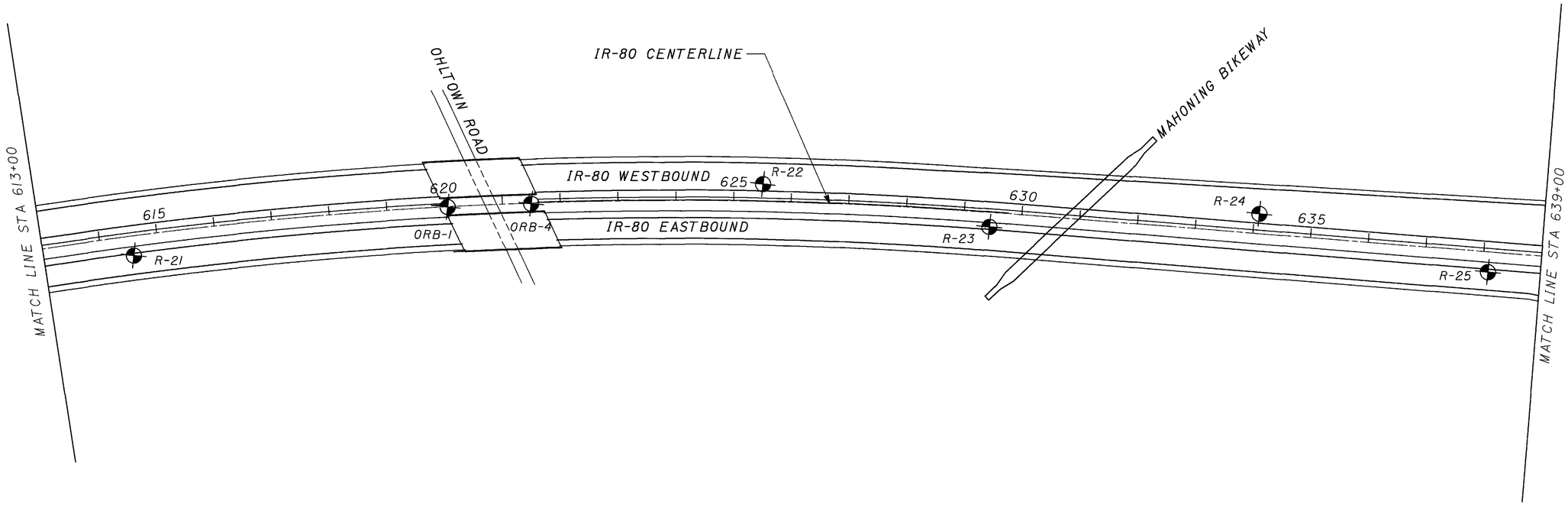

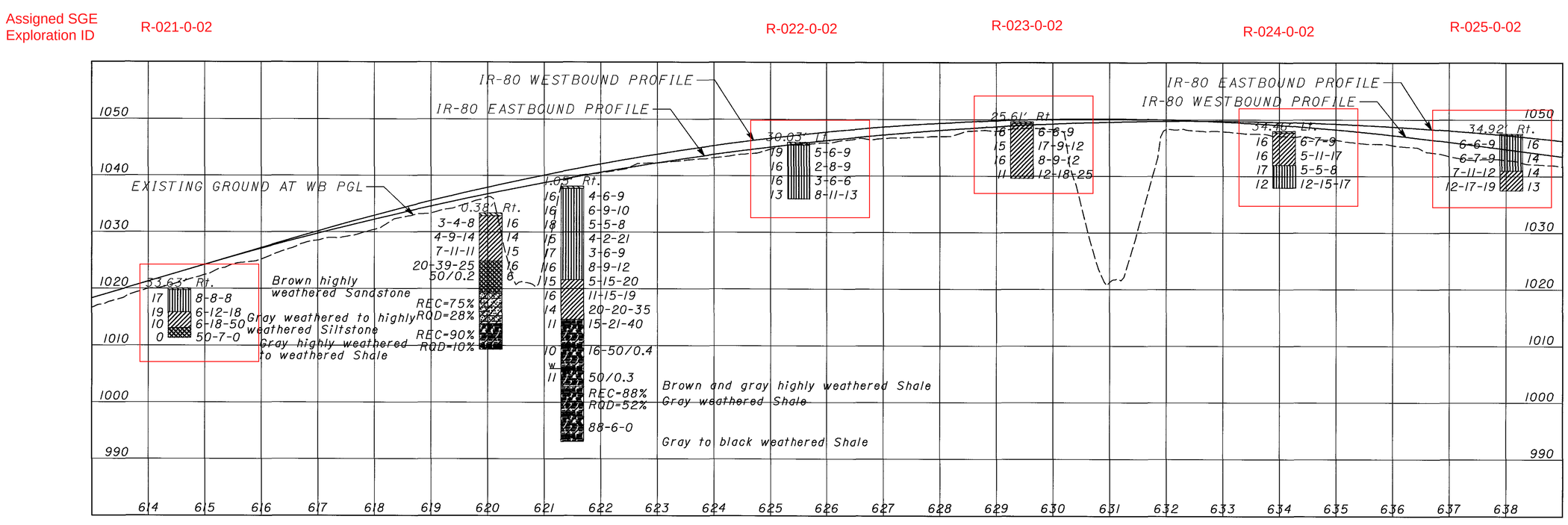

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DATE	REVIEWED	DRAWN
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MAHONING COUNTY
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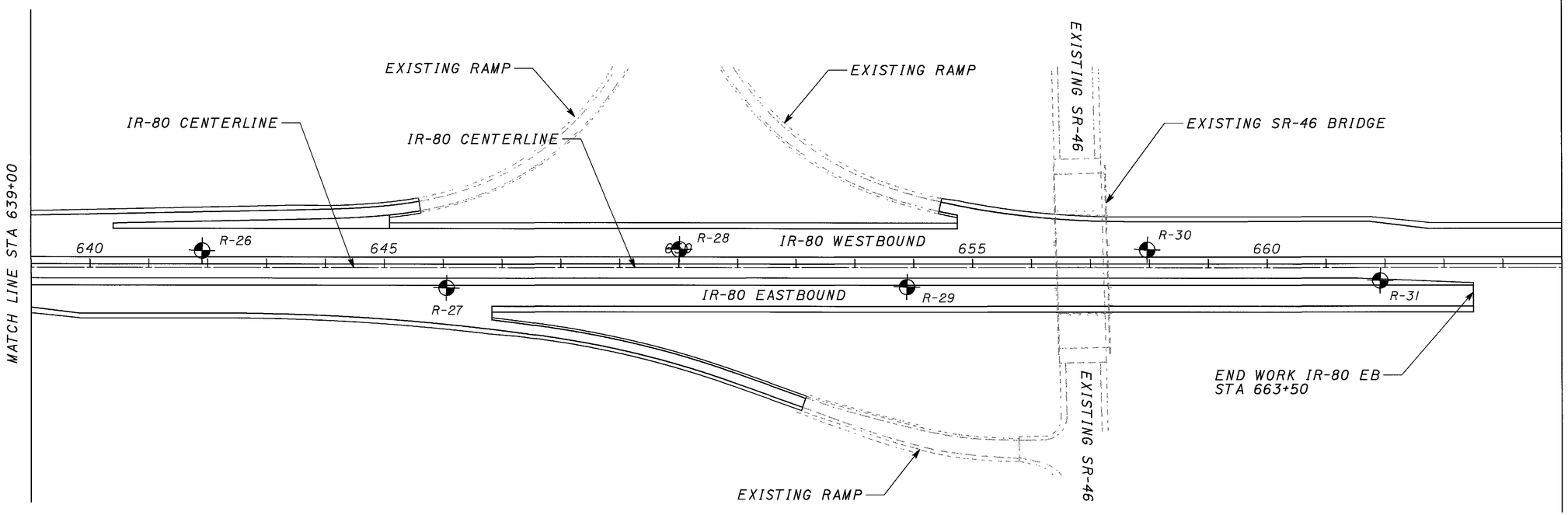

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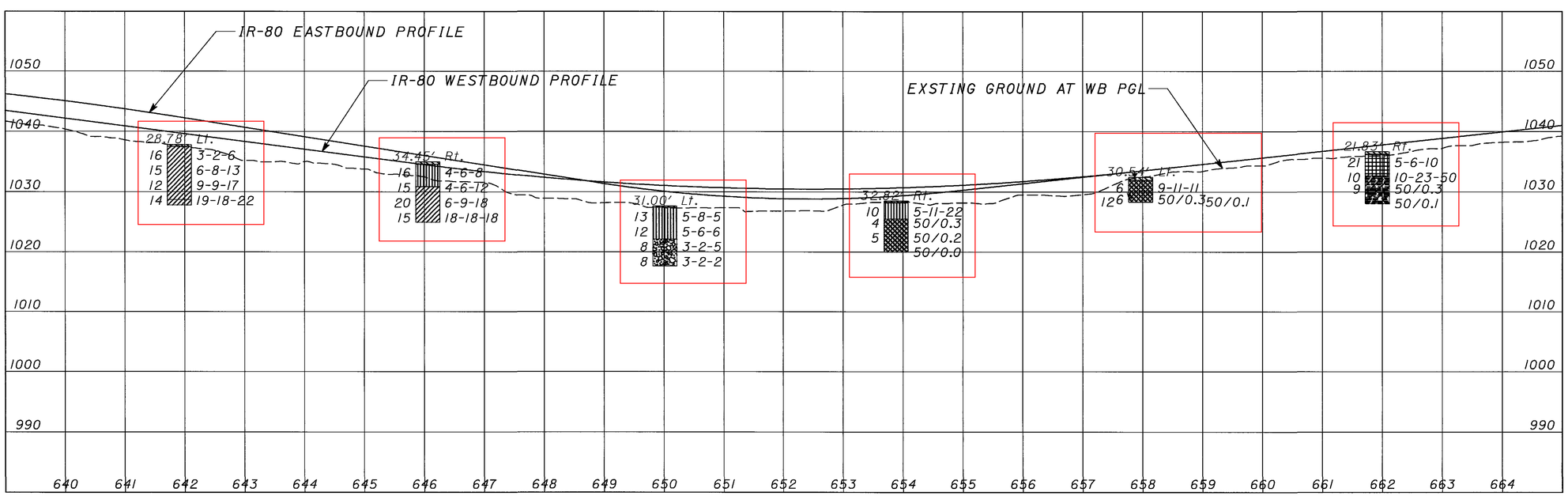

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CALCULATED	CHECKED
	S.S.

DATE	REVIEWED	DRAWN
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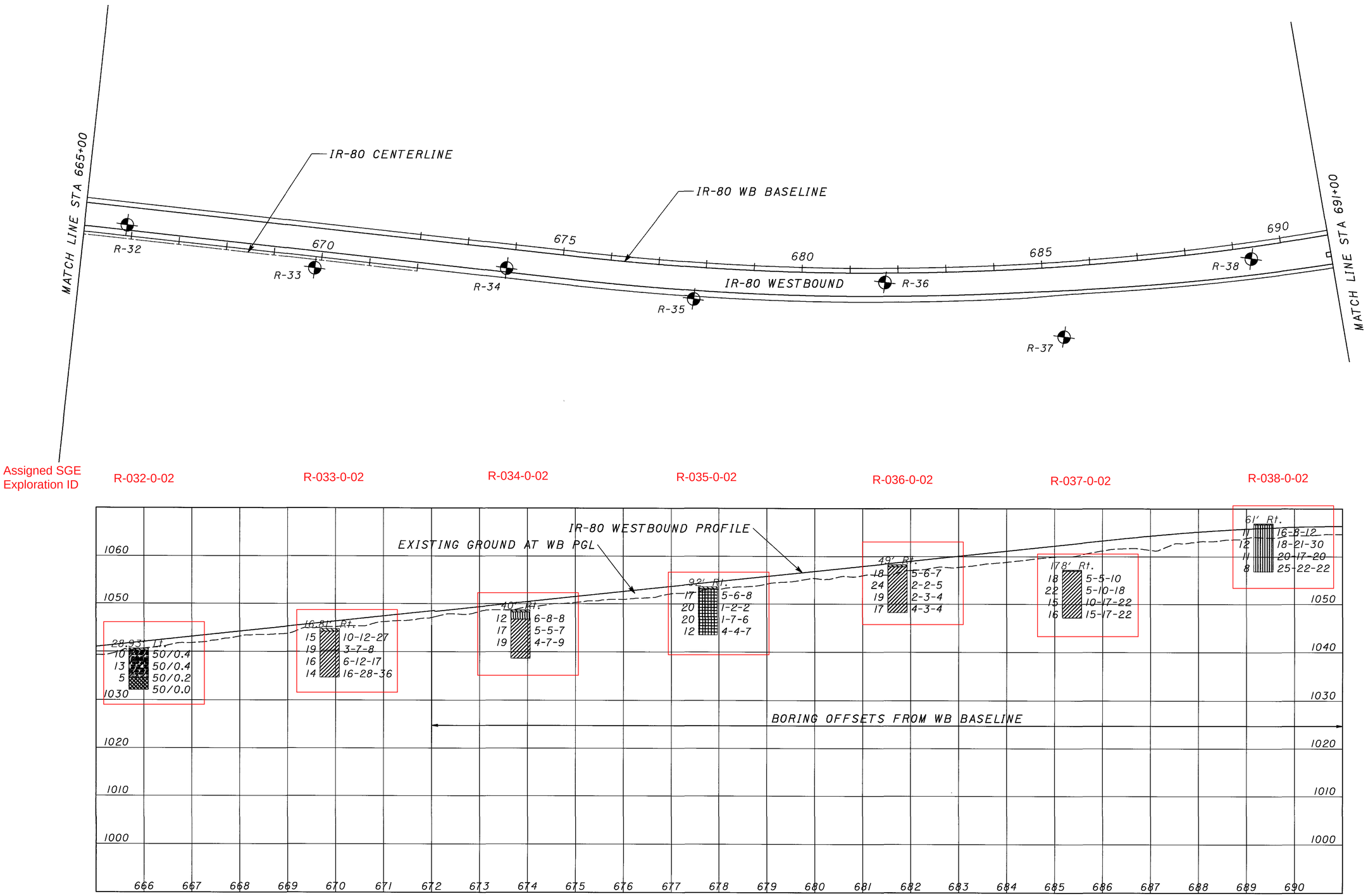

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ROADWAY SOIL PROFILE
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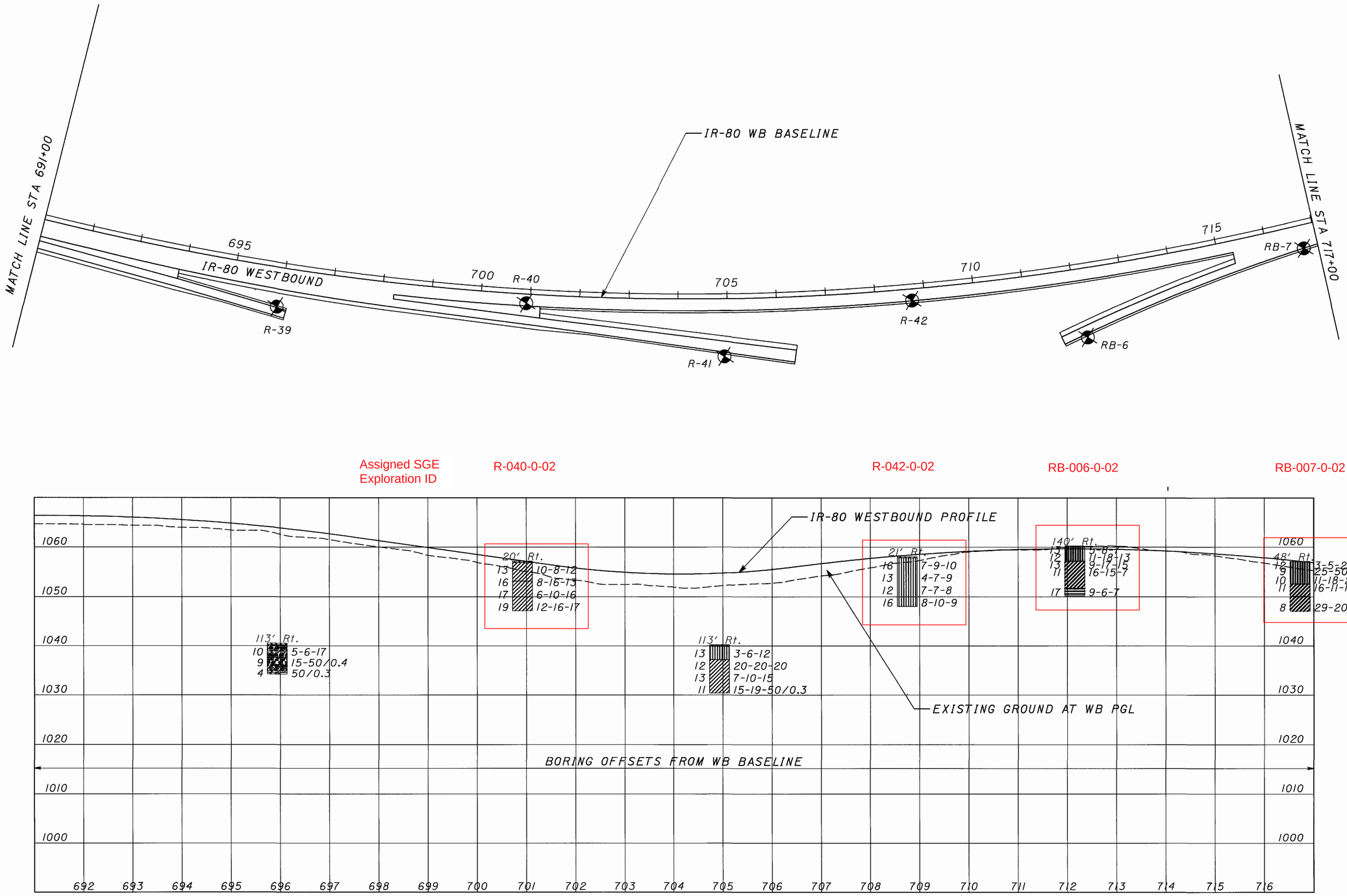

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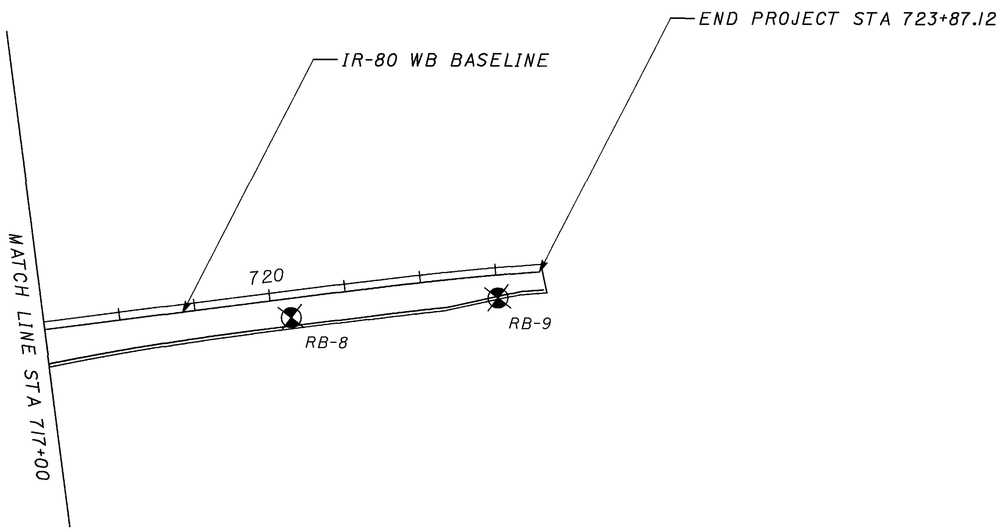

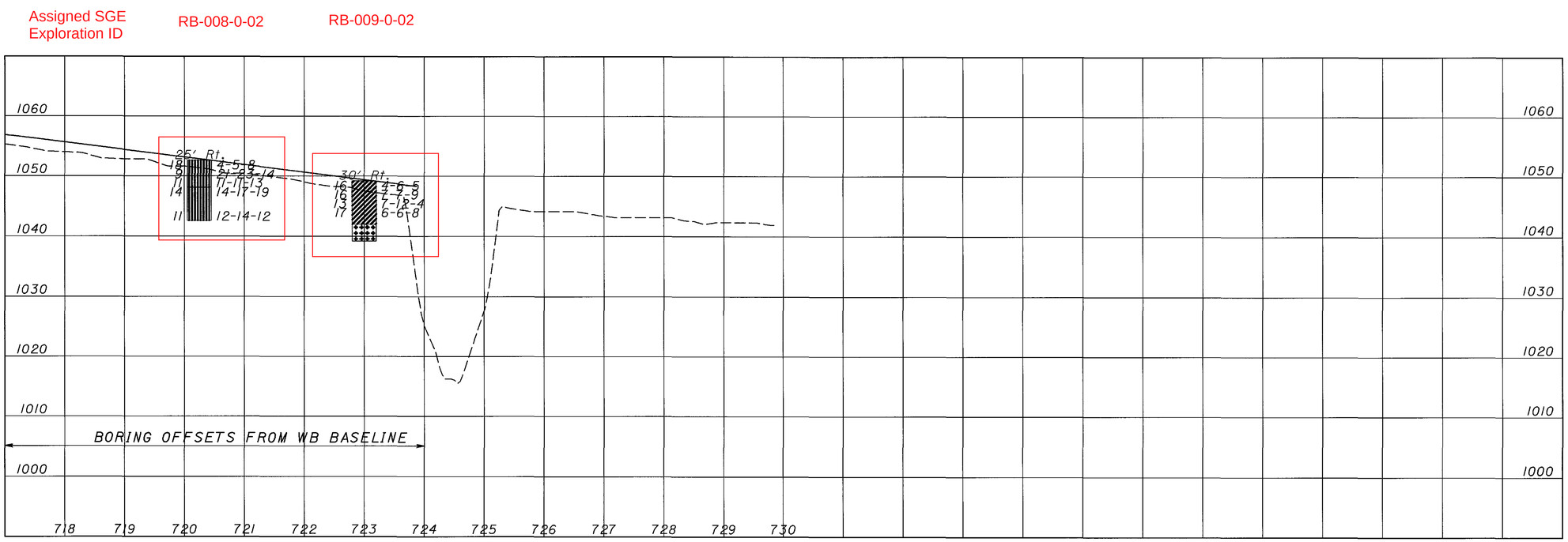

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DATE	REVIEWED	DRAWN
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ROADWAY SOIL PROFILE
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MAHONING COUNTY
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17 / 82

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SUMMARY OF SOIL DATA

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES THAT THE MATERIAL IS NON-PLASTIC
* SILT & CLAY COMBINED ** SAMPLE TAKEN AT OR NEAR FINAL GRADE

Assigned SGE Exploration ID	Station & Offset	Depth From	Depth To	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I.	% W.C.	ODOT Class
	483+50	0.0	1.5	Brown, Stiff to Very Stiff, SILT & CLAY, moist, some gravel, some sand, with sand lenses							22	VISUAL**
	30' Lt.	1.5	3.0	34	20	9	39*		29	11	17	A-6a
	(RB-1)	3.0	4.5	0	3	8	88*		39	20	16	A-6b
	RB-001-0-02	4.5	7.2	Brown, Grey Mottles, Very Stiff to Hard, SILTY CLAY, moist, trace sand							16	VISUAL
		7.2	10.0	27	6	11	56*		29	11	13	A-6a
	487+50	0.0	1.5	Brown, Grey Mottles, Very Stiff, SANDY SILT, moist, some clay, little gravel							13	VISUAL**
	30' Rt.	1.5	3.0	15	4	13	41	27	27	8	12	A-4a
	(RB-2)	3.0	4.5	8	8	12	73*		31	12	16	A-6a
	RB-002-0-02	4.5	7.5	6	5	12	39	38	24	8	18	A-4a
	491+50	0.0	1.5	Brown, Stiff, SILT & CLAY, moist, little rock fragments, some sand							15	VISUAL**
	30' Lt.	1.5	2.5	18	10	11	61*		30	12	15	A-6a
	(RB-3)	2.5	4.5	1	3	7	89*		36	18	27	A-6b
	RB-003-0-02	4.5	6.0	2	3	9	87*		36	16	19	A-6b
		8.5	10.0	Mottled Brown & Grey, Very Stiff to Hard, SILTY CLAY, moist, little sand							16	VISUAL
	500+63.00	0.2	1.0	Gray-brown SANDY SILT (embankment fill)							--	VISUAL
	28.00' Rt.	1.0	2.5	Gray-brown SANDY SILT (embankment fill)							14	VISUAL**
	(R-01)	2.5	3.5	Gray-brown SANDY SILT (embankment fill)							--	VISUAL
		3.5	5.0	Gray-brown SANDY SILT (embankment fill)							14	VISUAL
		5.0	5.5	Gray-brown SANDY SILT (embankment fill)							--	VISUAL
		5.5	6.0	Brown SANDY SILT (natural soil)							--	VISUAL
		6.0	7.5	3	6	14	40	36	26	7	19	A-4a
		7.5	8.5	Brown SANDY SILT (natural soil)							--	VISUAL
		8.5	10.0	Brown SANDY SILT with sandstone fragments (natural soil)							15	VISUAL
	504+62.92	0.2	1.0	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
	31.71' Lt.	1.0	2.5	Gray and brown SANDY SILT (embankment fill)							12	VISUAL**
	(R-02)	2.5	3.5	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
		3.5	5.0	Gray and brown SANDY SILT (embankment fill)							16	VISUAL
		5.0	5.5	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
		5.5	6.0	Brown SANDY SILT (natural soil)							--	VISUAL
		6.0	7.5	Brown SANDY SILT (natural soil)							11	VISUAL
		7.5	8.5	Brown SANDY SILT (natural soil)							--	VISUAL
		8.5	10.0	Brown SANDY SILT (natural soil)							12	VISUAL
	506+92	0.0	2.0	Brown SILT; dry; some gravel								Visual
	151' Rt	2.0	3.5	Brown SILTY SAND; dry; trace gravel								Visual
	(CB-1)	3.5	7.0	18	35	24	8	15	NP	NP	6	A-1-b
		7.0	9.5	22	60	14	5*		NP	NP	5	A-1-b
		9.5	13.5	Black GRAVEL WITH SAND; dry; trace brown Clay								Visual
		13.5	17.5	Grey SANDY SILT; moist; trace brown mottling								Visual
		17.5	20.0	20	8	11	37	24	20	5	10	A-4a
	508+64.63	0.3	1.0	Gray-brown SILT AND CLAY (embankment fill)							--	VISUAL
	28.98' Rt.	1.0	2.5	Gray-brown SILT AND CLAY (embankment fill)							13	VISUAL**
	(R-03)	2.5	3.5	Gray-brown SILT AND CLAY (embankment fill)							--	VISUAL
		3.5	5.0	5	4	11		80*	28	11	16	A-6a
		5.0	6.0	Gray-brown SILT AND CLAY (embankment fill)							--	VISUAL
		6.0	7.5	Gray-brown SILT AND CLAY (embankment fill)							9	VISUAL
		7.5	8.5	Gray-brown SILT AND CLAY (embankment fill)							--	VISUAL
		8.5	10.0	Gray-brown SILT AND CLAY (embankment fill)							6	VISUAL
	510+25	0.0	1.5	Black-dark grey SILT; little sand; trace organics; wet								Visual
	204' Rt	1.5	3.0	1	3	12	52	32	29	6	38	A-4b
	(CB-2)	3.0	4.7	Black-dark grey SILT; little sand; trace organics; wet								Visual
		4.7	5.5	4	29	32	12	23	NP	NP	20	A-3a
		5.5	7.5	0	0	1	16	83	45	19	32	A-7-6
		7.5	9.0	3	3	6	29	59	36	15	20	A-6a
		9.0	10.5	Brown SILT & CLAY; wet							21	Visual
		10.5	12.0	Brown SILT & CLAY; wet							19	Visual
		12.0	12.8	0	6	8	25	60	38	15	24	A-6a
		12.8	16.8	Mottled brown and grey SILT & CLAY; wet							24	Visual
		16.8	19.0	3	13	23	38	23	NP	NP	15	A-4a
		19.0	22.5	Grey SANDY SILT; moist								Visual
		22.5	25.7	8	6	20	40	26	21	5	10	A-4a
		25.7	27.7	Weathered grey MUDSTONE; clay to sand-sized grain; horizontal bedding								
	512+77.09	0.3	1.0	Brown/gray/black SILT AND CLAY (embankment fill)							--	VISUAL
	24.13' Lt.	1.0	2.5	8	5	12		75*	31	12	16	A-6a**
	(R-04)	2.5	3.5	Brown/gray/black SILT AND CLAY (embankment fill)							--	VISUAL
		3.5	4.6	Brown/gray/black SILT AND CLAY (embankment fill)							16	VISUAL
		4.6	6.0	Gray-brown SILT AND CLAY (natural soil)							--	VISUAL
		6.0	7.5	Gray-brown SILT AND CLAY (natural soil)							20	VISUAL
		7.5	8.5	Gray-brown SILT AND CLAY (natural soil)							--	VISUAL
		8.5	10.0	Gray-brown SILT AND CLAY (natural soil)							22	VISUAL
	513+78	0.0	0.6	Topsoil; Silt with organic matter; dark brown								Visual
	140' Rt	0.6	1.3	Light brown SANDY SILT; trace gravel								Visual
	(CB-3)	1.3	3.5	Light brown SANDY SILT; trace gravel							13	Visual
		3.5	6.0	0	11	52	17	21	NP	NP	12	A-4a
		6.0	8.5	Light brown SANDY SILT; trace gravel; with 1/4" grey silt seams							11	Visual
		8.5	13.9	0	0	1	8	91	47	18	24	A-7-6
		13.9	16.8	2	2	2	18	76	42	18	22	A-7-6
		16.8	20.0	Grey CLAY; trace gravel							23	Visual
	515+39	0.0	1.5	Brown CLAY; trace gravel and organics; moist								Visual
	302' Rt	1.5	3.0	Brown CLAY; trace gravel and sand; no organics; moist							24	Visual
	(CB-4)	3.0	4.5	Brown CLAY; trace gravel and sand; no organics; moist								Visual
		4.5	6.0	2	0	0	27	70	44	19	23	A-7-6
		6.0	7.5	Brown CLAY; trace sand; moist								Visual
		7.5	9.0	Brown CLAY; trace sand; moist							24	Visual
		9.0	11.2	Mottled brown and grey CLAY; trace sand; moist								Visual
		11.2	12.0	1	2	4	24	69	35	14	22	A-6a
		12.0	13.5	Grey SILT & CLAY; moist; trace sand.								Visual
		13.5	16.8	Grey SILT & CLAY; moist; trace sand.							21	Visual
		18.5	24.5	Grey SILT & CLAY; moist; trace sand.							20	Visual
		24.5	27.0	0	0	0	48	52	32	12	29	A-6a
		27.0	31.8	Grey CLAY; moist								Visual
		31.8	39.5	0	0	0	2	98	53	25	37	A-7-6
		39.5	41.8	Grey SILT & CLAY; moist.							37	Visual
		41.8	46.5	0	0	0	31	69	32	12	27	A-6a
		46.5	50.0	45	12	13	12	18	NP	NP	12	A-2-4
	516+97.87	0.3	1.0	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
	27.61' Rt.	1.0	2.5	Gray and brown SANDY SILT (embankment fill)							15	VISUAL**
	(R-05)	2.5	3.5	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
		3.5	4.4	Gray and brown SANDY SILT (embankment fill)							--	VISUAL
		4.4	5.0	0	1	1		98*	46	23	22	A-7-6
		5.0	6.0	Brown and gray CLAY (natural soil)							--	VISUAL
		6.0	7.5	Brown and gray CLAY (natural soil)							20	VISUAL
		7.5	8.5	Brown and gray CLAY (natural soil)							--	VISUAL
		8.5	10.0	Brown and gray CLAY (natural soil)							17	VISUAL

GANNETT FLEMING ENGINEERS & ARCHITECTS, P.C.
4151 EXECUTIVE PARKWAY, SUITE 350
WESTERVILLE, OHIO 43081

DRAWN	REVIEWED	DATE	CALCULATED	CHECKED
J.M.T.	M.W.W.	9/03/04		S.S.

ROADWAY SOIL PROFILE
SUMMARY OF SOIL DATA

MAHONING COUNTY
MAH-80-0.97

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SUMMARY OF SOIL DATA

NOTE: NP SHOWN IN LIQUID LIMIT AND PLASTICITY INDEX COLUMNS INDICATES THAT THE MATERIAL IS NON-PLASTIC
* SILT & CLAY COMBINED ** SAMPLE TAKEN AT OR NEAR FINAL GRADE

Station & Offset	Depth From	Depth To	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I.	% W.C.	ODOT Class
700+88.27	0.3	1.0	Brown and gray SILT AND CLAY (embankment fill)							--	VISUAL
19.92' Rt.	1.0	2.5	Brown and gray SILT AND CLAY (embankment fill)							13	VISUAL**
IR-80 WB B.L.	2.5	3.5	Brown and gray SILT AND CLAY (embankment fill)							--	VISUAL
(R-40)	3.5	4.0	Brown and gray SILT AND CLAY (embankment fill)							16	VISUAL
	4.0	5.5	Brown SILT AND CLAY (natural soil)							--	VISUAL
	5.5	6.0	Brown SILT AND CLAY (natural soil)							--	VISUAL
	6.0	7.5	3	4	8		84*	35	14	17	A-6a
	7.5	8.5	Brown SILT AND CLAY (natural soil)							--	VISUAL
	8.5	10.0	Brown SILT AND CLAY (natural soil)							19	VISUAL
704+87.68	0.3	1.0	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
113.00' Rt.	1.0	2.5	Brown and gray SANDY SILT (embankment fill)							13	VISUAL**
IR-80 WB B.L.	2.5	3.0	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
(R-41)	3.0	3.5	Brown-gray SILT AND CLAY (natural soil)							--	VISUAL
	3.5	5.0	Brown-gray SILT AND CLAY (natural soil)							12	VISUAL
	5.0	6.0	Brown-gray SILT AND CLAY (natural soil)							--	VISUAL
	6.0	7.5	Brown-gray SILT AND CLAY (natural soil)							13	VISUAL
	7.5	8.5	Brown-gray SILT AND CLAY (natural soil)							--	VISUAL
	8.5	9.8	Brown-gray SILT AND CLAY (natural soil)							11	VISUAL
708+70.79	0.2	1.0	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
21.30' Rt.	1.0	2.5	5	5	13	34	42	28	10	16	A-4a**
IR-80 WB B.L.	2.5	3.5	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
(R-42)	3.5	5.0	Brown and gray SANDY SILT (embankment fill)							13	VISUAL
	5.0	6.0	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
	6.0	7.5	Brown and gray SANDY SILT (embankment fill)							12	VISUAL
	7.5	8.5	Brown and gray SANDY SILT (embankment fill)							--	VISUAL
	8.5	10.0	Brown and gray SANDY SILT (embankment fill)							16	VISUAL
712+15	0.0	1.5	Brown, Very Stiff, SANDY SILT, moist, little gravel, some clay							13	VISUAL**
140' Rt.	1.5	3.0	18	6	13	33	30	27	10	12	A-4a
(RB-6)	3.0	4.5	18	8	13	61*		29	11	13	A-6a
RB-006-0-02	4.5	6.0	23	7	13	57*		28	11	11	A-6a
	8.5	10.0	19	4	12	65*		38	19	17	A-6b
716+72	0.0	1.5	Brown, Very Stiff to Hard, SANDY SILT, dry, some clay, little gravel							12	VISUAL**
48' Rt.	1.5	2.4	13	10	18	34	25	24	8	9	A-4a
(RB-7)	3.0	4.5	33	5	10	30	22	25	9	10	A-4a
RB-007-0-02	4.5	7.0	13	8	12	66*		27	11	11	A-6a
	7.0	10.0	Brown, Hard, SILT & CLAY, dry, some sand, some gravel							8	V:A-6a
720+25	0.0	1.5	Brown, Stiff to Hard, SANDY SILT, moist, some clay, little rock fragments							18	VISUAL**
25' Rt.	1.5	3.0	11	6	17	38	29	25	9	9	A-4a
(RB-8)	3.0	4.5	23	6	12	32	26	26	8	11	A-4a
RB-008-0-02	4.5	6.0	9	4	17	37	32	26	10	14	A-4a
	8.5	10.0	Brown, Very Stiff to Hard, SANDY SILT, moist, some clay, trace rock fragments							11	VISUAL
723+00	0.0	1.5	Brown, Stiff to Very Stiff, SILT & CLAY, moist some sand, little gravel							16	VISUAL**
30' Rt.	1.5	3.0	12	7	17	64*		29	12	16	A-6a
(RB-9)	3.0	4.5	12	8	15	65*		27	11	13	A-6a
RB-009-0-02	4.5	7.2	Brown, Stiff to Very Stiff, SILT & CLAY, moist some sand, little gravel							17	VISUAL
	7.2	10.0	3	2	8	59	28	25	6	15	A-4b

Assigned SGE Exploration ID

SERVICE ROAD BORINGS

Station & Offset	Depth From	Depth To	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L	P.I.	% W.C.	ODOT Class
8+45	0.0	4.5	11	5	12	33	39	32	14	12	A-6a**
C.L. Service Rd.	4.5	6.4	16	24	20	20	20	31	14	13	A-6a
(RB-4)	6.4	9.5	3	5	14	25	53	31	12	17	A-6a
	9.5	10.5	21	18	26	20	15	NP		14	A-2-4
	10.5	12.8	Brown, Very Stiff, GRAVEL w/ SAND & SILT, moist							14	VISUAL
	12.8	13.5	0	0	1	54	45	34	11	24	A-6a
	13.5	14.6	Brown, Very Stiff, SILT & CLAY, moist							23	VISUAL
	14.6	27.5	0	0	1	66	33	NP		24	A-4b
	27.5	29.4	Grey SHALE, very weathered, very soft								VISUAL
	29.4	36.0	Interbedded SANDSTONE, SILTSTONE & SHALE								VISUAL
13+50	0.0	3.5	3	4	2	33	58	42	19	14	A-7-6**
C.L. Service Rd.	3.5	4.5	14	6	17	63*		29	11	12	A-6a
(RB-5)	4.5	6.0	5	13	11	71*		32	13	14	A-6a
	6.0	7.8	Brown, Hard, SILT & CLAY, moist, some sand, trace gravel							15	VISUAL
	7.8	8.8	Lt. Brown, SILTSTONE, Soft								VISUAL
	8.8	13.4	Interbedded SANDSTONE & SHALE								VISUAL
	13.4	36.5	Interbedded SANDSTONE & SILTSTONE								VISUAL

GANNETT FLEMING ENGINEERS & ARCHITECTS, P.C.
4151 EXECUTIVE PARKWAY, SUITE 350
WESTERVILLE, OHIO 43081

CALCULATED | CHECKED S.S. | DATE 9/03/04 | REVIEWED M.W.W. | DRAWN J.M.T.

ROADWAY SOIL PROFILE
SUMMARY OF SOIL DATA

MAHONING COUNTY
MAH-80-0.97

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Assigned SGE Exploration ID LRB-001-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: LRB-01

STA. & OFFSET: 495+08.13, 10.51' Rt.

ELEVATION: 950.34ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 1/29/02 DATE COMPLETED: 1/29/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was encountered at 23.5 feet during drilling and was not measured upon completion of drilling operations due to water introduced into borehole during bedrock coring.

▼ GROUNDWATER DURING DRILLING

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
950.0	0.3		TOPSOIL													
			Very stiff to hard, gray and brown SILT AND CLAY (A-6a), some slag, trace asphalt, moist. (embankment fill)	1	1.0	29 50/0.4	50+	2.75	22	--	--		--	--		VISUAL
				2	3.5	15 12 10	22	3.25	34	--	--		--	--		VISUAL
944.3	6.0		Medium stiff to stiff, gray, cohesive SANDY SILT (A-4a), some clay, some gravel and slag, moist. (embankment fill)	3	6.0	3 3 3	6	3.25	16	25	17	8	19	19	32/30	A-4a
				4	8.5	3 9 9	18	1.75	28	--	--		--	--		VISUAL
939.3	11.0		Hard to very stiff, brown-gray, cohesive SANDY SILT (A-4a), some clay, little gravel, moist. (natural soil)	5	11.0	11 15 19	34	4.5+	13	--	--		--	--		VISUAL
				6	13.5	8 12 22	34	4.5+	15	--	--		--	--		VISUAL
				7	16.0	9 12 17	29	4.25	16	--	--		--	--		VISUAL
932.3	18.0		Very stiff to hard, gray, cohesive SANDY SILT (A-4a), some to little clay, trace to little gravel and rock fragments, moist to wet.	8	18.5	9 10 14	24	4.0	17	--	--		--	--		VISUAL
				9	21.0	22 16 22	38	4.5	12	--	--		--	--		VISUAL
926.7	23.6		Note: Thin (<2.0" thick), SILT seam, wet at 23.5 feet during drilling	10	23.5	30 25 29	54	--	14	--	--		--	--		VISUAL
			Soft to medium hard, gray, decomposed to highly weathered SANDY SILTSTONE.	11	26.0	30 50/0.2	50+	--	8	--	--		--	--		VISUAL
			Note: Augered to 29.0 feet and began coring bedrock.													
921.3	29.0		Hard, gray, weathered to slightly weathered SANDY SILTSTONE very thin to thin, nearly horizontal bedding, some natural, very close to close natural fractures mainly along bedding planes. Poor condition as per RQD.	Run 1	29.0											
			Note: U.C. Strength at 32.8 feet = 2454 psi (medium strength)				81% (32%)									
			Note: Some dark gray shale laminations and few, thin (<1.0" thick), dark gray, soft to medium hard SHALE seams throughout Run 1.													
911.3	39.0		TERMINATION DEPTH = 39.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/17/02

Assigned SGE Exploration ID LRB-005-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: LRB-05

STA. & OFFSET: 496+79.47, 0.46' Lt.

ELEVATION: 947.38ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 1/28/02 DATE COMPLETED: 1/28/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was encountered at 11.5 feet during drilling and was not measured upon completion of drilling operations due to water introduced into borehole during bedrock coring.

▼ GROUNDWATER DURING DRILLING

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
946.9	0.5		TOPSOIL													
			Stiff to hard, gray to brown, cohesive SANDY SILT (A-4a), some clay, little gravel and slag, moist. (embankment fill)	1	1.0	6 9 17	26	1.75	16	26	19	7	13	28	33/26	A-4a
				2	3.5	20 24 19	43	3.5	23	--	--		--	--		VISUAL
				3	6.5	6 8 7	15	3.5	21	--	--		--	--		VISUAL
				4	8.5	5 16 18	34	4.5+	19	--	--		--	--		VISUAL
935.9	11.5		Note: Wet at 11.5 feet during drilling.													
			Medium dense, brown to gray, non-cohesive SILT (A-4b), some sand, wet. (natural soil)	5	11.5	6 9 12	21	--	22	--	--		--	--		VISUAL
933.9	13.5		Very stiff to stiff, gray, cohesive SILTY SAND (A-4a), some to little clay, trace gravel, moist.	6	13.5	6 7 13	20	1.25	17	--	--		--	--		VISUAL
				7	16.5	3 4 5	9	2.75	11	--	--		--	--		VISUAL
928.9	18.5		Very loose to dense, gray, non-cohesive SILT (A-4b), little sand, no to trace rock fragments, wet.	8	18.5	WOH/1.5 WOH/1.5	--		23	--	--		--	--		VISUAL
				9	21.0	4 15 17	32	--	19	--	--		--	--		VISUAL
924.2	23.2			10	23.5		50+	--	12	--	--		--	--		VISUAL
923.4	24.0		Hard, gray, slightly weathered to weathered, SANDY SILTSTONE.	Run 1	24.0		50/0.4									
			Medium hard to hard, gray, weathered to slightly weathered SANDY SILTSTONE with thin to very thin, nearly horizontal bedding, some natural fractures mainly along bedding planes. Note: Bedrock is highly weathered from 24.5 to 24.8 feet and from 25.5 to 26.0 feet. Note: U.C. strength at 26.7 feet = 10,169 psi (high strength)				40% (16%)									
			Run 1 - Very poor condition as per RQD.													
			Note: Some, thin (<2" thick), dark gray SHALE seams from 27.0 to 39.0 feet.	Run 2	34.0		100% (48%)									
			Run 2 - Poor condition as per RQD.													
908.4	39.0		TERMINATION DEPTH = 39.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/17/02

Assigned SGE Exploration ID TRB-005-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: TRB-05

STA. & OFFSET: 586+30.39, 6.79' Lt.

ELEVATION: 949.65ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 1/29/02 DATE COMPLETED: 1/29/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was not encountered during drilling operations and was not measured upon completion due to water introduced into boring during rock coring operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
949.4	0.3		TOPSOIL													
			Very stiff, mottled brown and gray, cohesive SANDY SILT (A-4a), some slag and sandstone fragments, some clay, moist. (embankment fill)	1	1.0	3 6 20	26	4.5+	13	--	--		--	--		VISUAL
				2	3.5	29 11 6	17	2.25	16	35	22	13	35	16	49	A-6a
			Note: Encountered sandstone fragments in embankment fill at 6.5 feet.	3	6.0	11 8 8	16	1.5	8	--	--		--	--		VISUAL
942.2	7.5		Soft to hard, brown to gray, highly weathered to weathered SANDY SILTSTONE.	4	7.5	40 41 50/0.4	50+	3.75	8	--	--		--	--		VISUAL
				5	11.0	50/0.3	50+	--	7	--	--		--	--		VISUAL
			Note: Auger refusal at 14.0 feet and began coring bedrock.	6	13.5		50+	--	4	--	--		--	--		VISUAL
935.7	14.0		Medium hard to hard, brown to gray, highly weathered to weathered SANDY SILTSTONE with indistinct to moderate bedding, many very close natural fractures, some iron staining throughout Run 1. Poor condition as per RQD.	Run 1	14.0		50/0.1									
			Note: U.C. Strength at 14.7 feet = 157 psi (very low strength)				78% (34%)									
			Note: U.C. Strength at 19.9 feet = 857 psi (low strength)													
929.2	20.5		TERMINATION DEPTH = 20.5 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/22/02

Assigned SGE Exploration ID R-001-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-01

STA. & OFFSET: 500+63, 28' RT

ELEVATION: 941.87 ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
	0.2		TOPSOIL													
			Hard, gray-brown, cohesive SANDY SILT (A-4a), some clay, little gravel and rock fragments, moist. (embankment fill)	1	1.0	21, 15, 22	37	4.5+	14	--	--		--	--		VISUAL
				2	3.5	16, 19, 26	45	2.5	14	--	--		--	--		VISUAL
	5.5		Very stiff, brown, cohesive SANDY SILT (A-4a), some to little clay, trace to little gravel and sandstone fragments, moist. (natural soil)	3	6.0	6, 8, 11	19	3.0	19	26	19	7	3	21	40/36	A-4a
			Note: Decomposed sandstone fragments encountered at approximately 9.5 feet.	4	8.5	8, 11, 11	22	3.0	15	--	--		--	--		VISUAL
	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-002-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-02

STA. & OFFSET: 504+62.92, 31.71' Lt.

ELEVATION: 935.33ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
935.1	0.2		TOPSOIL													
			Very stiff to hard, brown and gray, cohesive SANDY SILT (A-4a), some clay, little gravel and rock fragments, moist. (embankment fill)	1	1.0	8 10 10	20	4.5	12	--	--		--	--		VISUAL
				2	3.5	12 23 30	53	3.0	16	--	--		--	--		VISUAL
929.8	5.5		Medium dense, brown, non-cohesive SANDY SILT (A-4a), little clay, little to some sandstone fragments, moist. (natural soil - appears to be decomposed sandstone)	3	6.0	8 7 8	15	2.0	11	--	--		--	--		VISUAL
				4	8.5	6 8 8	16	2.5	12	--	--		--	--		VISUAL
925.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/16/02

Assigned SGE Exploration ID R-003-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-03

STA. & OFFSET: 508+64.63, 28.98' Rt.

ELEVATION: 928.26ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
928.0	0.3		TOPSOIL													
			Hard, gray-brown SILT AND CLAY (A-6a), little sand, trace to some shale fragments, moist. (embankment fill)													
				1	1.0	9, 17, 20	37	4.5+	13	--	--		--	--		VISUAL
				2	3.5	11, 17, 17	34	1.5	16	28	17	11	5	14	80	A-6a
				3	6.0	11, 15, 17	32	4.5+	9	--	--		--	--		VISUAL
				4	8.5	17, 30, 30	60	--	6	--	--		--	--		VISUAL
			Note: Encountered many medium hard, gray, weathered shale fragments within the embankment fill at approximately 8.9 feet.													
918.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/16/02

Assigned SGE Exploration ID R-004-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-04

STA. & OFFSET: 512+77.09, 24.13' Lt.

ELEVATION: 921.69ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
921.4	0.3		Stiff, brown, gray and black SILT AND CLAY (A-6a), little sand, trace gravel and rock fragments, moist. (embankment fill)	1	1.0	6, 6, 9	15	4.5	16	31	19	12	8	17	75	A-6a
				2	3.5	12, 13, 15	28	4.5	16	--	--		--	--		VISUAL
917.1	4.6		Very stiff to hard, gray-brown SILT AND CLAY (A-6a), little to trace sand, trace gravel, moist. (natural soil)	3	6.0	10, 15, 23	38	4.5+	20	--	--		--	--		VISUAL
				4	8.5	20, 29, 33	62	4.5	22	--	--		--	--		VISUAL
911.7	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/16/02

Assigned SGE Exploration ID R-005-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-05

STA. & OFFSET: 516+97.87, 27.61' Rt.

ELEVATION: 917.52ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
917.2	0.3		TOPSOIL													
			Hard, gray and brown SANDY SILT (A-4a), some to little shale/rock fragments and gravel, moist. (embankment fill)	1	1.0	8, 12, 25	37	4.5	15	--	--		--	--		VISUAL
				2	3.5	3, 8, 12	20	4.0	22	46	23	23	0	2	98	A-7-6
913.1	4.4		Very stiff to hard, mottled brown and gray CLAY (A-7-6), trace sand, moist. (natural soil)	3	6.0	20, 24, 30	54	4.0	20	--	--		--	--		VISUAL
				4	8.5	20, 21, 21	42	4.5	17	--	--		--	--		VISUAL
907.5	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-006-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-06

STA. & OFFSET: 546+33.65, 21.48' Lt.

ELEVATION: 918.04ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
917.6	0.4		Dense, light gray SLAG (A-1-a). (fill)													
				1	1.0	15, 18, 27	45	4.0	20	--	--		--	--		VISUAL
916.0	2.0		Stiff to medium stiff, dark gray and gray, weathered to decomposed SHALE FRAGMENTS WITH SAND, SILT AND CLAY (A-2-6), moist. (embankment fill)													
				2	3.5	6, 5, 9	14	2.5	12	--	--		--	--		VISUAL
				3	6.0	4, 4, 4	8	--	10	--	--		--	--		VISUAL
				4	8.5	4, 4, 2	6	--	8	--	--		--	--		VISUAL
908.0	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/22/02

Assigned SGE Exploration ID R-007-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-07

STA. & OFFSET: 550+39.07, 33.66' Rt.

ELEVATION: 918.30ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
918.1	0.2		TOPSOIL													
			Medium dense, dark gray, non-cohesive SANDY SILT AND SHALE FRAGMENTS (A-4a), moist. (embankment fill)													
				1	1.0	9, 13, 10	23	4.5+	10	NP	NP	NP	39	14	47	A-4a
				2	3.5	4, 4, 8	12	0.75	13	--	--		--	--		VISUAL
913.3	5.0		Hard, brown-gray, cohesive SANDY SILT (A-4a), some rock fragments, some to little clay, moist. (embankment fill)													
				3	6.0	10, 18, 20	38	4.5	11	--	--		--	--		VISUAL
				4	8.5	12, 22, 20	42	2.0	13	--	--		--	--		VISUAL
908.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-008-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-08

STA. & OFFSET: 554+32.10, 33.59' Lt.

ELEVATION: 918.25ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL LIQUID LIMIT	PL PLASTIC LIMIT	PI PLASTICITY INDEX	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
918.1	0.2		TOPSOIL													
			Very stiff, gray and brown SANDY SILT (A-4a), some clay, little gravel and rock fragments, moist. (embankment fill)													
				1	1.0	17 7 10	17	--	17	32	28	4	18	30	23/30	A-4a
915.1	3.2		Medium dense, dark gray, SHALE FRAGMENTS WITH SAND, SILT AND CLAY (A-2-6), moist. (embankment fill)													
				2	3.5	7 6 5	11	--	10	--	--		--	--		VISUAL
				3	6.0	5 6 8	14	3.0	12	--	--		--	--		VISUAL
				4	8.5	6 10 10	20	4.5+	16	--	--		--	--		VISUAL
909.1	9.2		Very stiff, brown SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)													
908.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-009-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-09

STA. & OFFSET: 558+22.17, 32.54' Rt.

ELEVATION: 918.34ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
918.0	0.3		TOPSOIL													
			Very stiff to hard, brown and gray, cohesive SANDY SILT (A-4a), some clay, little to some rock fragments, moist. (embankment fill)	1	1.0	10 7 11	18	4.5	13	32	28	4	16	20	32/33	A-4a
				2	3.5	6 8 12	20	4.5	11	--	--		--	--		VISUAL
				3	6.0	4 5 9	14	4.5	12	--	--		--	--		VISUAL
				4	8.5	12 20 25	45	--	11	--	--		--	--		VISUAL
908.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-010-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-10

STA. & OFFSET: 562+22.29, 32.36' Lt.

ELEVATION: 918.59ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
918.2	0.4		Very stiff to medium stiff, brown-gray SILT AND CLAY (A-6a), trace sand, trace rock fragments, moist. (embankment fill)	1	1.0	6, 9, 10	19	4.0	19	37	22	15	3	9	26/63	A-6a
				2	3.5	3, 4, 4	8	2.5	19	--	--		--	--		VISUAL
			Note: Trace organics at 7.0 feet.	3	6.5	4, 6, 14	20	3.5	15	--	--		--	--		VISUAL
911.6	7.0		Very stiff to hard, mottled brown and gray SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)	4	8.5	13, 20, 24	44	4.5+	22	--	--		--	--		VISUAL
908.6	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 7/9/02

Assigned SGE Exploration ID R-011-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-11

STA. & OFFSET: 566+20.43, 34.63' Rt.

ELEVATION: 919.19ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
918.7	0.5		Very stiff, brown, cohesive SANDY SILT (A-4a), "and" clay, trace rock fragments, moist. (embankment fill)	1	1.0	4, 6, 10	16	4.5+	14	23	19	4	5	20	33/42	A-4a
916.2	3.0		Stiff to hard, brown-gray SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)	2	3.5	3, 4, 7	11	3.5	18	--	--		--	--		VISUAL
				3	6.0	6, 13, 19	32	4.5+	15	--	--		--	--		VISUAL
				4	8.5	16, 19, 20	39	4.25	18	--	--		--	--		VISUAL
909.2	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-012-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-12

STA. & OFFSET: 570+19.40, 29.32' Lt.

ELEVATION: 922.94ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
922.2	0.7		Very stiff, brown SANDY SILT (A-4a), some clay, little gravel, moist. (possible natural soil from topsoil to termination)	1	1.0	6 8 9	17	2.0	18	30	20	10	13	25	28/35	A-4a
				2	3.5	8 9 8	17	3.25	15	--	--		--	--		VISUAL
				3	6.5	8 6 12	18	2.5	18	--	--		--	--		VISUAL
914.4	8.5		Hard, gray SILTY CLAY (A-6b), trace sand, moist. (natural soil)	4	8.5	15 30 34	64	--	18	--	--		--	--		VISUAL
912.9	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-013-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-13

STA. & OFFSET: 574+21.44, 32.62' Rt.

ELEVATION: 929.50ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
929.0	0.5		Very stiff to hard, brown SILTY CLAY (A-6a), trace sand, trace gravel, moist. (possible natural soil from topsoil to termination)	1	1.0	3, 7, 16	23	4.5+	17	39	23	16	2	8	91	A-6b
				2	3.5	8, 16, 26	42	4.5+	19	--	--		--	--		VISUAL
				3	6.0	8, 14, 16	30	4.5+	18	--	--		--	--		VISUAL
				4	8.5	8, 22, 27	49	4.5+	24	--	--		--	--		VISUAL
919.5	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-014-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-14

STA. & OFFSET: 578+15.61, 33.28' Lt.

ELEVATION: 936.32ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/5/02 DATE COMPLETED: 2/5/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
935.8	0.5		Very stiff, brown SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)	1	1.0	5, 12, 12	24	4.5+	13	--	--		--	--		VISUAL
933.3	3.0		Stiff to very stiff, brown, cohesive SANDY SILT (A-4a), some clay, trace gravel, moist. (natural soil)	2	3.5	5, 8, 8	16	3.75	14	--	--		--	--		VISUAL
				3	6.5	6, 6, 8	14	1.75	20	25	18	7	1	18	49/32	A-4a
				4	8.5	6, 8, 11	19	4.0	12	--	--		--	--		VISUAL
926.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-015-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-15

STA. & OFFSET: 590+22.05, 33.93' Rt.

ELEVATION: 956.77ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
956.5	0.3		TOPSOIL													
			Medium stiff to hard, gray, brown and black, cohesive SANDY SILT (A-4a), little to some clay, trace shale and other rock fragments, moist. (embankment fill)	1	1.0	7 12 16	28	2.75	13	--	--		--	--		VISUAL
				2	3.5	8 9 14	23	4.5+	14	--	--		--	--		VISUAL
				3	6.0	4 2 4	6	4.0	14	--	--		--	--		VISUAL
				4	8.5	8 16 29	45	4.5+	13	--	--		--	--		VISUAL
946.8	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-016-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-16

STA. & OFFSET: 594+16.18, 33.99' Lt.

ELEVATION: 964.58ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL LIQUID LIMIT	PL PLASTIC LIMIT	PI PLASTICITY INDEX	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
964.1	0.5		Very stiff, brown CLAY (A-7-6), trace sand, trace gravel, moist. (embankment fill)	1	1.0	6 9 9	18	4.5+	18	41	23	18	5	8	27/60	A-7-6
962.1	2.5		Very stiff, brown-gray CLAY (A-7-6), trace sand, trace gravel, moist. (natural soil)	2	3.5	6 9 17	26	4.5+	16	--	--		--	--		VISUAL
				3	6.0	23 50/0.3	50+	--	7	--	--		--	--		VISUAL
958.1	6.5		Medium hard, light brown, weathered, SANDY SILTSTONE.													
955.9	8.7		TERMINATION DEPTH = 8.7 FEET	4	8.5	50/0.2	50+	--	6	--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 7/9/02

Assigned SGE Exploration ID R-017-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-17

STA. & OFFSET: 598+14.48, 33.31' Rt.

ELEVATION: 974.04ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL	PL	PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
973.7	0.3		TOPSOIL													
			Very stiff, brown SILT AND CLAY (A-6a), little rock fragments, little sand, moist. (embankment fill)	1	1.0	5, 7, 9	16	4.25	15	33	18	15	12	17	71	A-6a
971.0	3.0		Medium stiff, brown-gray CLAY (A-7-6), trace sand, trace gravel, moist. (natural soil)	2	3.5	6, 9, 9	18	2.5	23	--	--		--	--		VISUAL
				3	6.0	2, 3, 3	6	2.25	29	44	23	21	1	5	93	A-7-6
				4	8.5	10, 12, 13	25	2.0	16	--	--		--	--		VISUAL
965.0	9.0		Very soft, light brown and gray, decomposed SANDY SILTSTONE.													
964.0	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-018-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-18

STA. & OFFSET: 602+24.38, 32.66' Lt.

ELEVATION: 986.21ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
985.7	0.5		Very stiff, gray and brown, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)	1	1.0	15, 9, 9	18	4.5+	11	--	--		--	--		VISUAL
				2	3.5	4, 7, 9	16	4.5+	16	--	--		--	--		VISUAL
				3	6.0	3, 8, 11	19	4.5+	13	--	--		--	--		VISUAL
978.2	8.0		Very stiff, gray SILTY CLAY (A-6b), trace gravel, trace sand, moist. (natural soil)	4	8.5	12, 13, 13	26	3.5	19	--	--		--	--		VISUAL
976.2	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-019-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-19

STA. & OFFSET: 606+14.11, 34.75' Rt.

ELEVATION: 996.71ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/6/02 DATE COMPLETED: 2/6/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
996.2	0.5		Very stiff, brown and gray SILTY CLAY (A-6b), little rock fragments, trace sand, moist. (embankment fill)	1	1.0	4 5 13	18	4.25	11	--	--		--	--		VISUAL
				2	3.5	9 12 13	25	3.0	18	38	22	16	4	11	86	A-6b
990.7	6.0		Very stiff to hard, gray-brown CLAY (A-7-6), trace gravel, trace sand, moist. (natural soil)	3	6.0	6 9 13	22	4.5+	15	--	--		--	--		VISUAL
				4	8.5	16 19 20	39	4.5	18	--	--		--	--		VISUAL
986.7	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-020-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-20

STA. & OFFSET: 610+34.80, 20.36' Lt.

ELEVATION: 1008.82ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL	PL	PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1008.4	0.4		Stiff, gray, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)	1	1.0	5, 8, 9	17	2.0	11	28	19	9	17	27	30/26	A-4a
				2	3.5	4, 7, 7	14	3.25	11	--	--		--	--		VISUAL
1003.8	5.0		Stiff to hard, mottled brown and gray SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)	3	6.0	5, 6, 6	12	4.5+	13	--	--		--	--		VISUAL
				4	8.5	17, 15, 19	34	4.5	14	--	--		--	--		VISUAL
998.8	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-021-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-21

STA. & OFFSET: 614+55.40, 33.63' Rt.

ELEVATION: 1020.04ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1019.7	0.3		TOPSOIL													
			Very stiff, brown, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)	1	1.0	8, 8, 8	16	1.25	17	--	--		--	--		VISUAL
				2	3.5	6, 12, 18	30	3.5	19	--	--		--	--		VISUAL
1015.8	4.2		Very stiff, brown SILT AND CLAY (A-6a), little sand, trace sandstone fragments, moist. (natural soil)													
				3	6.0	6, 18, 50/0.1	50+	0.75	10	--	--		--	--		VISUAL
1013.0	7.0		Very soft to hard, brown, decomposed to weathered, micaceous, fine-grained SANDSTONE.													
				4	8.5	50/0.2	50+	--	7	--	--		--	--		VISUAL
1011.3	8.7		TERMINATION DEPTH = 8.7 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-022-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-22

STA. & OFFSET: 625+49.92, 30.03' Lt.

ELEVATION: 1045.93ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL LIQUID LIMIT	PL PLASTIC LIMIT	PI PLASTICITY INDEX	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1045.4	0.5		Stiff to very stiff, brown-gray, cohesive SANDY SILT (A-4a), some clay, some rock fragments, moist. (embankment fill)	1	1.0	5 6 9	15	1.0	19	34	25	9	30	17	24/29	A-4a
				2	3.5	2 8 9	17	2.75	16	--	--		--	--		VISUAL
				3	6.0	3 6 6	12	4.5	16	--	--		--	--		VISUAL
				4	8.5	8 11 13	24	4.5+	13	--	--		--	--		VISUAL
1035.9	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-023-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-23

STA. & OFFSET: 629+45.52, 25.61' Rt.

ELEVATION: 1049.62ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1049.3	0.3		TOPSOIL													
			Stiff to hard, brown and gray SILT AND CLAY (A-6a), little sand, little to some gray shale fragments, moist. (embankment fill)	1	1.0	6 6 9	15	2.25	16	--	--		--	--		VISUAL
				2	3.5	17 9 12	21	2.0	15	--	--		--	--		VISUAL
				3	6.0	8 9 12	21	4.0	16	35	21	14	18	14	69	A-6a
				4	8.5	12 18 25	43	--	11	--	--		--	--		VISUAL
			Note: Some gray shale fragments encountered from 9.0 to 10.0 feet.													
1039.6	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-024-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-24

STA. & OFFSET: 634+08.56, 34.46' Lt.

ELEVATION: 1047.95ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1047.7	0.3		TOPSOIL													
			Very stiff, brown and gray SILT AND CLAY (A-6a), little sand, trace to little rock fragments, moist. (embankment fill)	1	1.0	6 7 9	16	3.75	16	--	--		--	--		VISUAL
				2	3.5	5 11 17	28	0.5	16	--	--		--	--		VISUAL
1042.0	6.0		Stiff to hard, brown and gray, cohesive SANDY SILT (A-4a), some clay, little to some rock fragments, moist. (embankment fill)	3	6.0	5 5 8	13	1.75	17	--	--		--	--		VISUAL
			Note: Some shale fragments in the 8.5 foot sample.	4	8.5	12 15 17	32	4.5+	12	--	--		--	--		VISUAL
1038.0	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-025-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-25

STA. & OFFSET: 638+09.53, 34.92' Rt

ELEVATION: 1047.49ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1047.3	0.2		TOPSOIL													
			Stiff to very stiff, brown and gray, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)	1	1.0	6 6 9	15	3.5	16	29	19	10	13	20	32/35	A-4a
				2	3.5	6 7 9	16	3.75	14	--	--		--	--		VISUAL
				3	6.0	7 11 12	23	2.75	14	--	--		--	--		VISUAL
1041.0	6.5		Very stiff to hard, gray SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)	4	8.5	12 17 19	36	4.5+	13	--	--		--	--		VISUAL
1037.5	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-026-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-26

STA. & OFFSET: 641+90.95, 28.78' Lt.

ELEVATION: 1037.82ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1037.5	0.3		TOPSOIL													
			Medium stiff to very stiff, brown, gray and black SILT AND CLAY (A-6a), little sand, trace to little rock fragments, moist. (embankment fill)	1	1.0	3 2 6	8	4.5+	16	--	--		--	--		VISUAL
				2	3.5	6 8 13	21	3.5	15	29	18	11	5	18	76	A-6a
				3	6.0	9 9 17	26	4.5+	12	--	--		--	--		VISUAL
			Note: Trace coal and little shale fragments at 9.0 feet.	4	8.5	19 18 22	40	4.5+	14	--	--		--	--		VISUAL
1028.7	9.1		Hard, brown-gray SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)													
1027.8	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-027-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-27

STA. & OFFSET: 646+05.50, 34.45' Rt.

ELEVATION: 1034.98ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION
			TOPSOIL
1034.6	0.4		Stiff, brown and gray, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)
1030.9	4.1		Very stiff to hard, brown-gray SILT AND CLAY (A-6a), trace sand, trace gravel and rock fragments, moist. (natural soil)
			Note: Some decomposed sandstone fragments at 9.5 feet.
1025.0	10.0		TERMINATION DEPTH = 10.0 FEET

SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT (LL)	PLASTIC LIMIT (PL)	PLASTICITY INDEX (PI)	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1	1.0	4 6 8	14	2.75	16	--	--		--	--		VISUAL
2	3.5	4 6 12	18	4.5	15	--	--		--	--		VISUAL
3	6.0	6 9 18	27	2.5	20	36	21	15	8	9	84	A-6a
4	8.5	18 18 18	36	4.25	15	--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-028-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-28

STA. & OFFSET: 650+01.41, 31.00' Lt.

ELEVATION: 1027.64ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1027.4	0.2		TOPSOIL													
			Stiff, brown and gray, cohesive SANDY SILT (A-4a), some clay, little rock fragments, moist. (embankment fill)													
				1	1.0	5 8 5	13	4.5+	13	--	--		--	--		VISUAL
				2	3.5	5 6 6	12	3.0	12	--	--		--	--		VISUAL
1022.1	5.5		Loose to very loose, brown SANDSTONE FRAGMENTS WITH SAND (A-1-b), some to trace silt, moist. (natural, decomposed sandstone bedrock)													
				3	6.0	3 2 5	7	--	8	NP	NP	NP	27	50	23	A-1-b
				4	8.5	3 2 2	4	--	8	--	--		--	--		VISUAL
1017.6	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-029-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-29

STA. & OFFSET: 653+88.65, 32.82' Rt.

ELEVATION: 1028.51ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL	PL	PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1028.2	0.3		TOPSOIL													
			Hard, brown and gray, cohesive SANDY SILT (A-4a), little rock fragments, little sand, moist. (embankment fill)	1	1.0	5, 11, 22	33	4.5+	10	--	--		--	--		VISUAL
1025.5	3.0		Medium hard to hard, brown, highly weathered to weathered, fine-grained SANDSTONE.	2	3.5	50/0.3	50+	--	4	--	--		--	--		VISUAL
				3	6.0	50/0.2	50+	--	5	--	--		--	--		VISUAL
1020.0	8.5		Note: Spoon refusal at 8.5 feet. TERMINATION DEPTH = 8.5 FEET	4	8.5	50/0.0	50+	--		--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-030-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-30

STA. & OFFSET: 657+96.69, 30.54' Lt.

ELEVATION: 1032.46ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was encountered at 3.5 feet during drilling and at 3.0 feet upon completion of drilling operations.

▼ GROUNDWATER DURING DRILLING ▽ GROUNDWATER UPON COMPLETION

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1032.0	0.5		Soft to hard, brown and gray, decomposed to weathered, fine-grained SANDSTONE. (natural bedrock)													
				1	1.0	9 11 11	22	--	6	--	--		--	--		VISUAL
			Note: Sample wet at 3.5 feet during drilling.	2	3.5	50/0.3	50+	--	6	--	--		--	--		VISUAL
			Note: Spoon refusal encountered at 4.1 feet.	3	4.0	50/0.1	50+	--	12	--	--		--	--		VISUAL
1028.4	4.1		TERMINATION DEPTH = 4.1 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-031-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-31

STA. & OFFSET: 661+91.82, 21.83' Rt.

ELEVATION: 1036.67ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL	PL	PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1036.3	0.4		Very stiff, brown CLAY (A-7-6), trace sand, trace gravel, moist. (possible natural soil)	1	1.0	5 6 10	16	4.5+	21	44	24	20	1	5	94	A-7-6
				2	3.5	10 23 50/0.3	50+	4.5+	10	--	--		--	--		VISUAL
1032.7	4.0		Very soft to medium hard, brown and gray, highly weathered SANDY SHALE. (natural bedrock)													
				3	6.0	50/0.3	50+	--	9	--	--		--	--		VISUAL
			Note: Spoon refusal at 8.6 feet.													
1028.1	8.6		TERMINATION DEPTH = 8.6 FEET	4	8.5	50/0.1	50+	--		--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-032-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-32

STA. & OFFSET: 665+88.71, 28.93' Lt.

ELEVATION: 1040.62ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/13/02 DATE COMPLETED: 2/13/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LL LIQUID LIMIT	PL PLASTIC LIMIT	PI PLASTICITY INDEX	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL												
1040.2	0.4		Very soft, brown, highly weathered SANDY SHALE. (natural bedrock)												
				1	1.0	50+ 50/0.4	--	10	--	--		--	--		VISUAL
				2	3.5	50+ 50/0.4	--	13	--	--		--	--		VISUAL
1034.6	6.0		Medium hard, gray, weathered, fine-grained SANDSTONE.	3	6.0	50+ 50/0.2	--	5	--	--		--	--		VISUAL
			Note: Auger and spoon refusal at 8.5 feet.												
1032.1	8.5		TERMINATION DEPTH = 8.5 FEET	4	8.5	50+ 50/0.0			--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-033-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-33

STA. & OFFSET: 669+87.35, 16.81' Rt.

ELEVATION: 1044.71ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1044.2	0.5		Hard to stiff, brown and gray SILT AND CLAY (A-6a), little sand, moist. (embankment fill)	1	1.0	10, 12, 27	39	4.5	15	--	--		--	--		VISUAL
				2	3.5	3, 7, 8	15	3.25	19	37	22	15	0	12	44/44	A-6a
1040.2	4.5		Very stiff to hard, brown-gray SILT AND CLAY (A-6a), little sand, trace to some gravel, moist. (natural soil)													
				3	6.0	6, 12, 17	29	4.5+	16	--	--		--	--		VISUAL
				4	8.5	16, 28, 36	64	4.5+	14	--	--		--	--		VISUAL
			Note: Encountered large sandstone gravel at 9.0 feet.													
1034.7	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 7/9/02

Assigned SGE Exploration ID R-034-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-34

STA. & OFFSET: 673+85.17, 26.43' Lt.

ELEVATION: 1048.67ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION
1048.3	0.4		TOPSOIL
			Very stiff, brown, cohesive SANDY SILT (A-4a), some clay, little shale fragments, moist. (embankment fill)
1046.8	1.9		Stiff to very stiff, mottled brown and gray, SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)
1038.7	10.0		TERMINATION DEPTH = 10.0 FEET

SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1	1.0	6 8 8	16	1.5	12	--	--		--	--		VISUAL
2	3.5	5 5 7	12	3.75	17	--	--		--	--		VISUAL
3	6.0	4 7 9	16	3.5	19	--	--		--	--		VISUAL
4	8.5	8 12 15	27	3.25	16	--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-035-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-35

STA. & OFFSET: 378+21.59, 65.99' Rt.

ELEVATION: 1053.55ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/8/02 DATE COMPLETED: 2/8/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:

North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:

Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION
1053.2	0.4		TOPSOIL
			Soft to stiff, brown-gray CLAY (A-7-6), little sand, trace gravel, moist. (possible natural soil)
1043.6	10.0		Note: Fine grained sandstone fragments encountered at 9.5 feet. TERMINATION DEPTH = 10.0 FEET

SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1	1.0	5 6 8	14	4.5+	17	50	21	29	4	13	82	A-7-6
2	3.5	1 2 2	4	0.75	20	--	--		--	--		VISUAL
3	6.0	1 7 6	13	1.5	20	--	--		--	--		VISUAL
4	8.5	4 4 7	11	2.5	12	--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/21/02

Assigned SGE Exploration ID R-036-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-36

STA. & OFFSET: 382+17.76, 19.17' Rt.

ELEVATION: 1058.26ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/14/02 DATE COMPLETED: 2/14/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
			TOPSOIL													
1057.9	0.4		Stiff to medium stiff, brown SILT AND CLAY (A-6a), little sand, trace to some rock fragments, moist. (embankment fill)	1	1.0	5 6 7	13	2.25	18	--	--		--	--		VISUAL
				2	3.5	2 2 5	7	0.0	24	32	20	12	7	12	80	A-6a
				3	6.0	2 3 4	7	2.5	19	--	--		--	--		VISUAL
			Note: Some gray shale fragments at 8.8 feet.	4	8.5	4 3 4	7	0.5	17	--	--		--	--		VISUAL
1048.3	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-037-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-37

STA. & OFFSET: 385+81.45, 145.47' Rt.

ELEVATION: 1057.20ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1057.0	0.2		TOPSOIL													
			Stiff to hard, brown SILT AND CLAY (A-6a), little sand, trace rock fragments, moist. (possible natural soil)													
				1	1.0	5, 5, 10	15	3.0	18	34	20	14	6	15	32/47	A-6a
				2	3.5	5, 10, 18	28	2.75	22	--	--		--	--		VISUAL
				3	6.0	10, 17, 22	39	4.5+	15	--	--		--	--		VISUAL
				4	8.5	15, 17, 22	39	3.75	16	--	--		--	--		VISUAL
1047.2	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 7/9/02

Assigned SGE Exploration ID R-038-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-38

STA. & OFFSET: 389+80.25, 24.45' Rt.

ELEVATION: 1066.90ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1066.7	0.2		TOPSOIL													
			Very stiff to hard, brown and gray, cohesive SANDY SILT (A-4a), some clay, little gravel, moist. (embankment fill)													
				1	1.0	16 8 12	20	4.5+	11	26	17	9	16	23	32/29	A-4a
				2	3.5	18 21 30	51	4.5+	12	--	--		--	--		VISUAL
				3	6.0	20 17 20	37	4.5+	11	--	--		--	--		VISUAL
			Note: Large sandstone gravel encountered at 8.5 feet.	4	8.5	25 22 22	44	3.0	8	--	--		--	--		VISUAL
1056.9	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-040-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-40

STA. & OFFSET: 2+92.16, 18.30' Rt.

ELEVATION: 1057.15ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97

PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION	SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1056.9	0.3		TOPSOIL													
			Very stiff, brown and gray SILT AND CLAY (A-6a), little sand, trace gravel and rock fragments, moist. (embankment fill)	1	1.0	10, 8, 12	20	3.25	13	--	--		--	--		VISUAL
				2	3.5	8, 16, 13	29	4.0	16	--	--		--	--		VISUAL
1053.2	4.0		Very stiff to hard, brown SILT AND CLAY (A-6a), little sand, trace gravel, moist. (natural soil)													
				3	6.0	6, 10, 16	26	4.0	17	35	21	14	3	12	84	A-6a
				4	8.5	12, 16, 17	33	4.5+	19	--	--		--	--		VISUAL
1047.2	10.0		TERMINATION DEPTH = 10.0 FEET													

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Assigned SGE Exploration ID R-042-0-02

PRIME ENGINEERING & ARCHITECTURE INC.

TEST BORING No.: R-42

STA. & OFFSET: 10+74.71, 23.31' Rt.

ELEVATION: 1058.08ft

CLIENT: Gannett Fleming Engineers and Architects, P.C.

PROJECT: MAH-80-0.97 PROJECT No.: G01083

LOCATION: Mahoning County, Ohio

DATE STARTED: 2/15/02 DATE COMPLETED: 2/15/02

SAMPLER DIAM: 2.0" TYPE: SS HAMMER WT.: 140lb FALL: 30"

CASING DIAM: 3.25" TYPE: HSA OTHER:

DRILLING INFORMATION:
North America Drilling, Inc. using a CME-55 Truck-Mounted Drill Rig

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling or upon completion of drilling operations.

ELEV (ft.)	DEPTH (ft.)	Soil/ Rock Symbol	MATERIAL DESCRIPTION
1057.9	0.2		TOPSOIL
			Very stiff to stiff, brown and gray, cohesive SANDY SILT (A-4a) "and" clay, trace to some rock fragments, moist. (embankment fill)
			Note: Some sandstone and trace coal in the 8.5 foot sample.
1048.1	10.0		TERMINATION DEPTH = 10.0 FEET

SAMPLE NUMBER	SAMPLE DEPTH	BLOWS/6 INCHES	N-VALUE (BLOWS/FT) OR REC%/(RQD%)	PENETROMETER (tons/ft²)	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	AGGREGATE (%)	COARSE AND FINE SAND (%)	SILT AND CLAY COMBINED(%) OR SILT(%)/CLAY(%)	CLASSIFICATION SYMBOL
1	1.0	7 9 10	19	4.5+	16	28	18	10	5	19	34/42	A-4a
2	3.5	4 7 9	16	4.25	13	--	--		--	--		VISUAL
3	6.0	7 7 8	15	4.5	12	--	--		--	--		VISUAL
4	8.5	8 10 9	19	2.5	16	--	--		--	--		VISUAL

NOTES/REMARKS: SS = Split Spoon, HSA = Hollow Stem Auger, WOH = Weight of Hammer

TEST_BORING_LOG2 G01083B.GPJ PRIMENG.GDT 5/15/02

Appendix C – Pavement Core and Granular Base Information

PAVEMENT CORE SUMMARY TABLE AND PHOTOS

PAVEMENT CORE IDENTIFICATION SHEET

Identified by: Kevin Harper

Date Identified: 4/10/2025

Project No.: 23-17-0065E

Project Name:: MAH-76/80-8.50/0.00

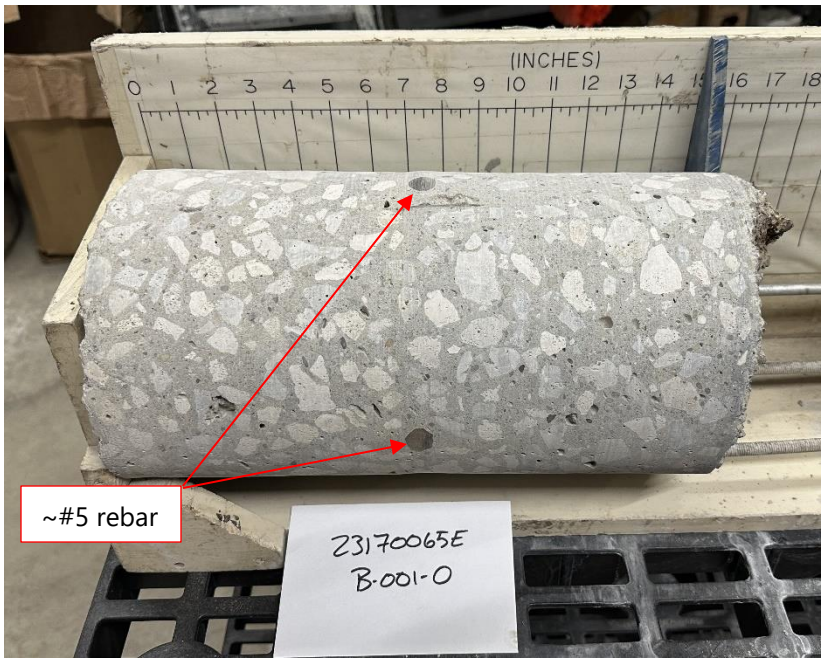
S&ME, Inc. - Columbus: 6190 Enterprise Court, Dublin, Ohio, 43016

Core Number	Coordinates*		Location in Road (distance from south curb)**	Asphalt (in.)	Concrete (in.)	Total Core Length (in.)	Notes: (slag concrete, highly broken up, etc.)
	Latitude	Longitude					
B-001-0-25	41.109803	-80.840547	Westbound Inside Shoulder	--	15	15	~#5 Rebar located approximately 7.5-Inches below pavement surface
B-002-0-25	41.109722	-80.838974	Eastbound Inside Shoulder	--	14 3/4	14 3/4	
B-003-0-25	41.110067	-80.837556	Westbound Inside Shoulder	--	15	15	~#5 Rebar located approximately 8-Inches below pavement surface
B-004-0-25	41.109979	-80.836073	Eastbound Inside Shoulder	--	14 1/2	14 1/2	
B-005-0-25	41.110318	-80.834717	Westbound Inside Shoulder	--	15	15	
B-006-0-25	41.110233	-80.833202	Eastbound Inside Shoulder	--	14.75	14 3/4	
B-007-0-25	41.110704	-80.831398	Westbound Inside Shoulder	--	15	15	~#5 Rebar located approximately 7.5-Inches below pavement surface
B-008-0-25	41.110744	-80.827478	Eastbound Inside Shoulder	--	14 1/2	14 1/2	
B-009-0-25	41.111266	-80.824915	Westbound Inside Shoulder	--	15	15	~#5 Rebar located approximately 8-Inches below pavement surface
B-010-0-25	41.110744	-80.827478	Eastbound Inside Shoulder	--	15	15	
B-011-0-25	41.111068	-80.823805	Eastbound Inside Shoulder	--	13 1/4	13 1/4	
B-012-0-25	41.111671	-80.820311	Westbound Outside Shoulder	--	13	13	
B-013-0-25	41.111623	-80.816507	Eastbound Inside Shoulder	--	12.75	12 3/4	
B-014-0-25	41.115109	-80.805769	Eastbound Inside Shoulder	--	14 1/4	14 1/4	
B-015-0-25	41.116721	-80.802776	Westbound Outside Shoulder	--	14 1/4	14 1/4	
B-016-0-25	41.117758	-80.799377	Eastbound Inside Shoulder	--	11.75	11 3/4	
B-017-0-25	41.11904	-80.796147	Eastbound Inside Shoulder	--	14	14	
B-018-0-25	41.120619	-80.792904	Westbound Outside Shoulder	--	15 1/4	15 1/4	
B-019-0-25	41.121556	-80.789799	Eastbound Inside Shoulder	--	13.75	13 3/4	
B-020-0-25	41.122651	-80.786401	Eastbound Inside Shoulder	--	12 1/2	12 1/2	
B-021-0-25	41.123619	-80.782926	Westbound Outside Shoulder	--	14 1/4	14 1/4	
B-022-0-25	41.123694	-80.779254	Eastbound Inside Shoulder	--	13	13	
B-023-0-25	41.123724	-80.775662	Eastbound Inside Shoulder	--	14 1/4	14 1/4	
B-024-0-25	41.12399	-80.772038	Westbound Outside Shoulder	--	14	14	
B-025-0-25	41.123742	-80.768731	Eastbound Inside Shoulder	--	13 1/2	13 1/2	
B-026-0-25	41.123751	-80.765833	Eastbound Inside Shoulder	15 1/4	--	15 1/4	Top 1-inch of asphalt separated upon core removal
B-027-0-25	41.124229	-80.758246	Westbound Outside Shoulder	--	13.75	14	
B-028-0-25	41.12604	-80.751561	Westbound Outside Shoulder	--	13 3/4	13 3/4	
B-029-0-25	41.1293	-80.746298	Westbound Outside Shoulder	--	13 1/4	13 1/4	

Date: 2/12/2025

Photographer: KAH

1	Boring	B-001-0
	Remarks	I-76 Westbound Inside Shoulder



Date: 2/12/2025

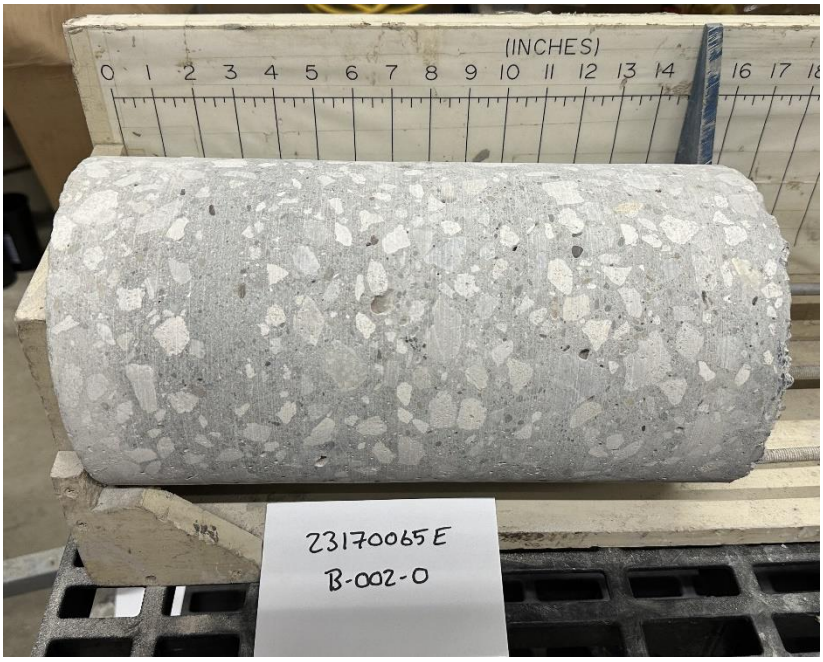
Photographer: KAH

2	Boring	B-001-0
	Remarks	Lat: 41.109803°, Long: -80.840547°, Rebar located ~7.5" below pavement surface

Date: 2/12/2025

Photographer: KAH

3	Boring	B-002-0
	Remarks	I-76 Eastbound Inside Shoulder



Date: 2/12/2025

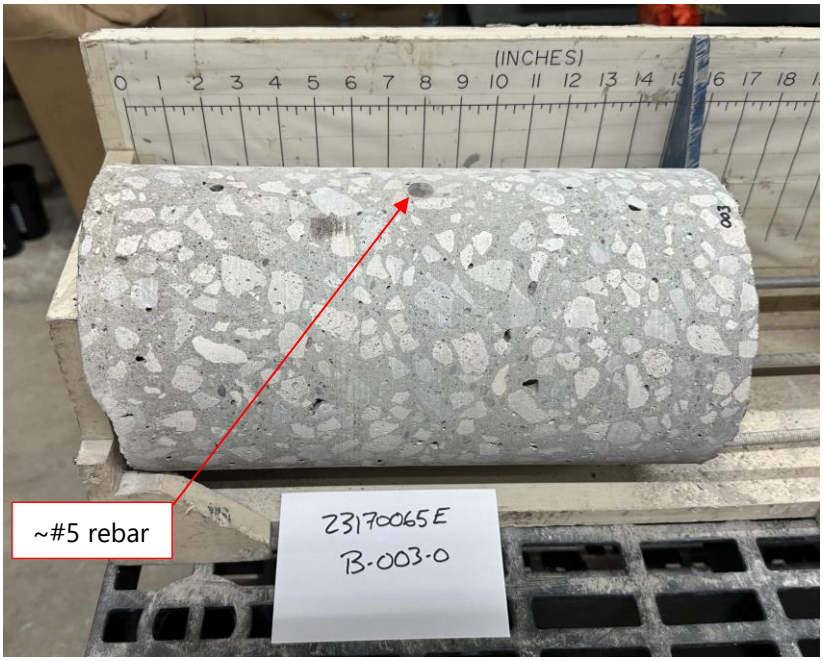
Photographer: BJB

4	Boring	B-002-0
	Remarks	Lat: 41.109722°, Long: -80.838974°

Date: 2/12/2025

Photographer: KAH

5	Boring	B-003-0
	Remarks	I-76 Westbound Inside Shoulder



Date: 2/12/2025

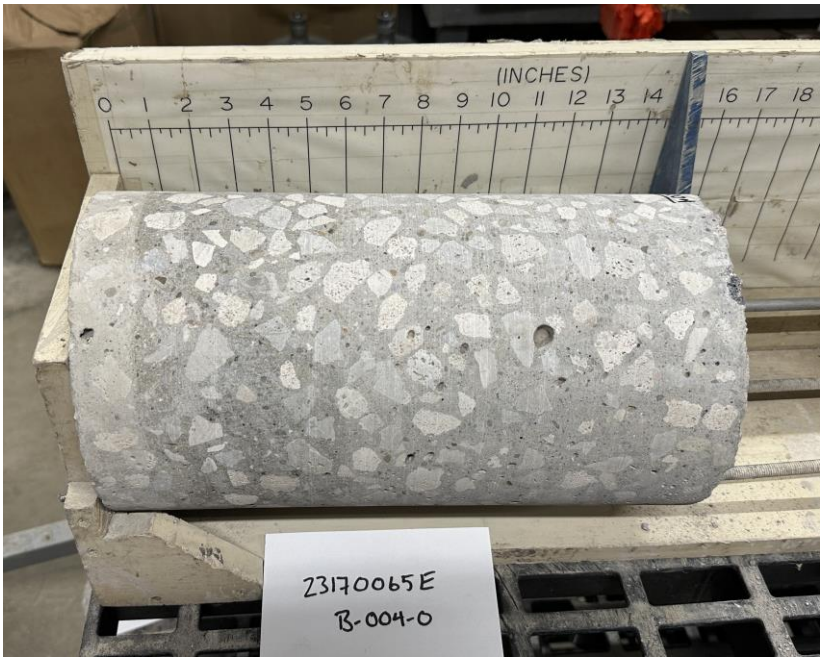
Photographer: KAH

6	Boring	B-003-0
	Remarks	Lat: 41.110067°, Long: -80.837556°, Rebar located ~8" below pavement surface. Extends through both sides of core.

Date: 2/12/2025

Photographer: KAH

7	Boring	B-004-0
	Remarks	I-76 Eastbound Inside Shoulder



Date: 3/19/2025

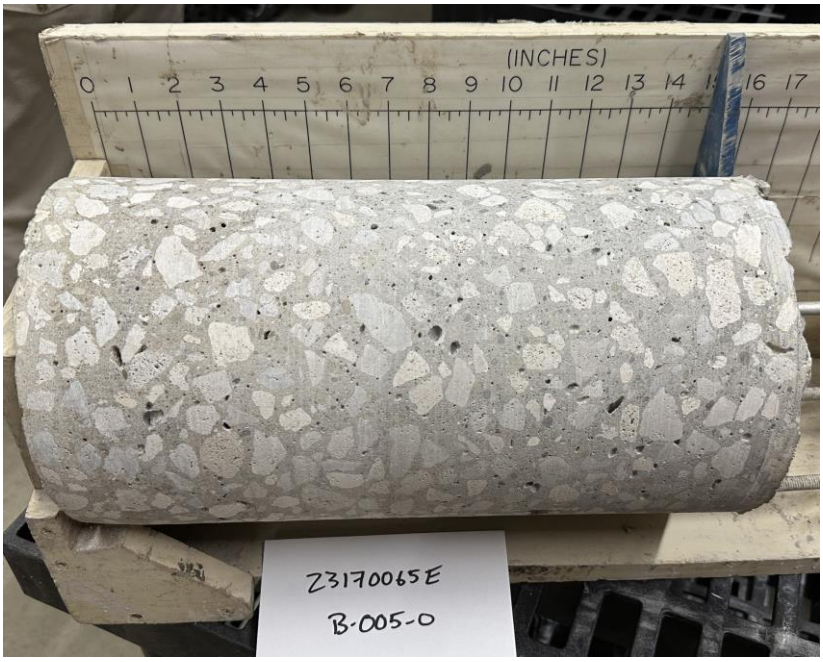
Photographer: KAH

8	Boring	B-004-0
	Remarks	Lat: 41.109979°, Long: -80.836073°

Date: 2/12/2025

Photographer: KAH

9	Boring	B-005-0
	Remarks	I-76 Westbound Inside Shoulder



Date: 2/12/2025

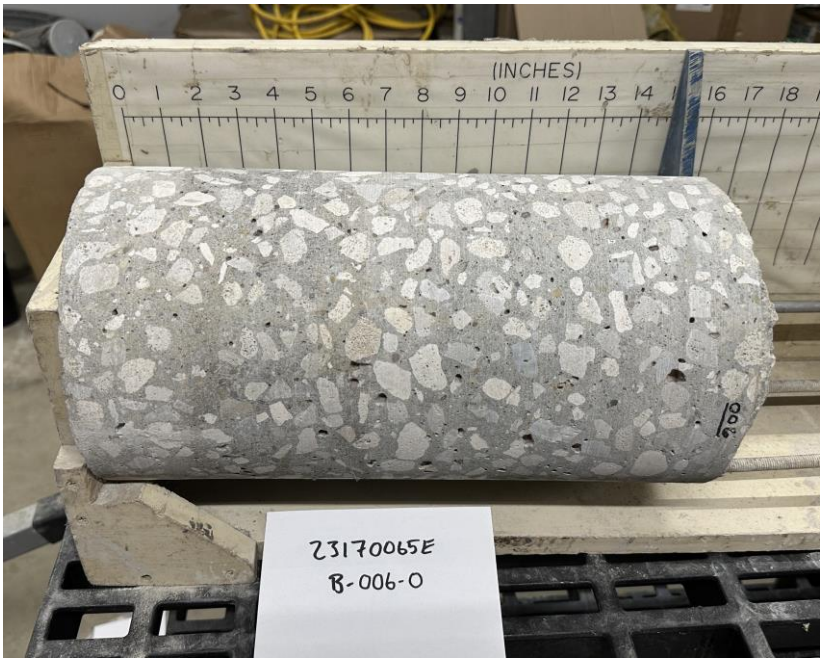
Photographer: KAH

10	Boring	B-005-0
	Remarks	Lat: 41.110318°, Long: -80.834717°

Date: 2/12/2025

Photographer: KAH

11	Boring	B-006-0
	Remarks	I-76 Eastbound Inside Shoulder



Date: 2/12/2025

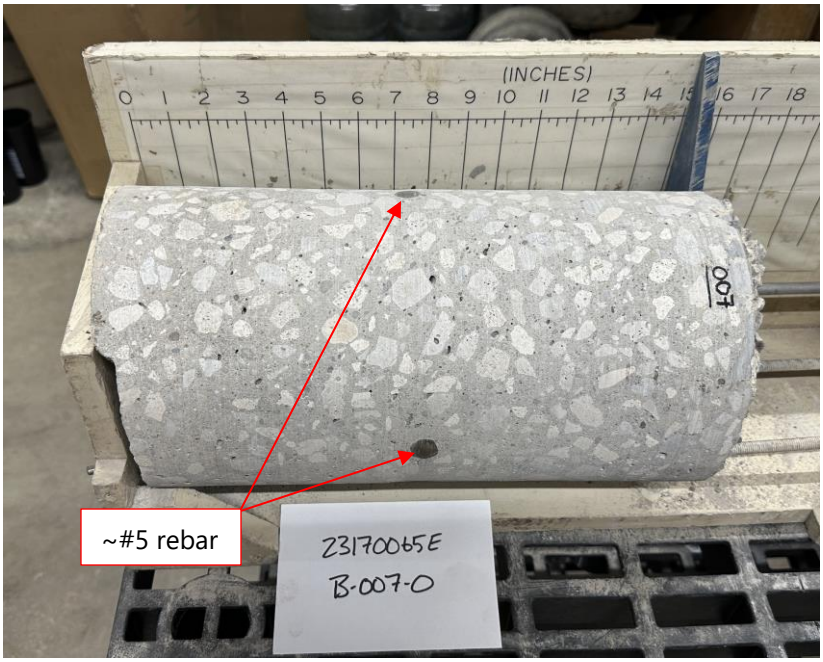
Photographer: KAH

12	Boring	B-006-0
	Remarks	Lat: 41.110233°, Long: -80.833202°

Date: 2/12/2025

Photographer: KAH

13	Boring	B-007-0
	Remarks	I-76 Westbound Inside Shoulder



Date: 3/19/2025

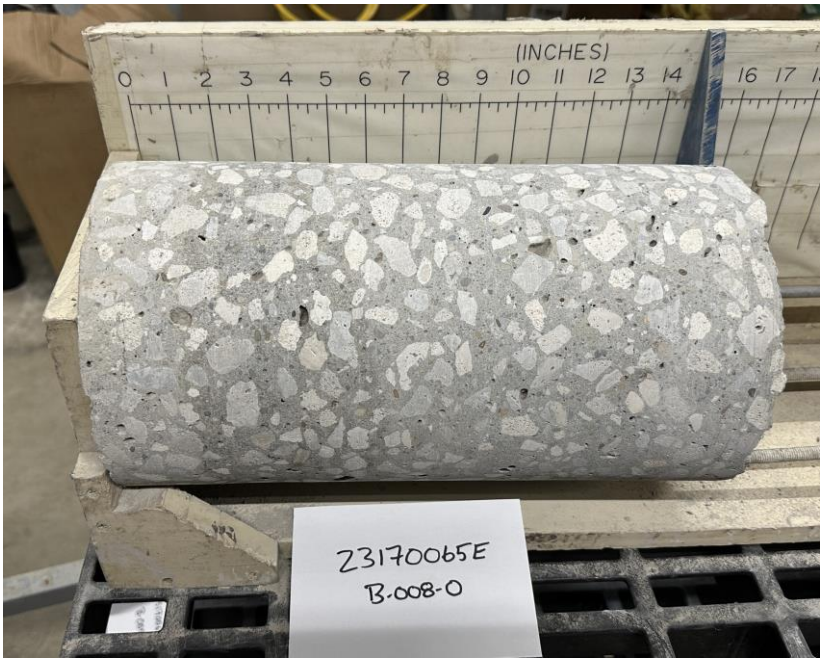
Photographer: BJB

14	Boring	B-007-0
	Remarks	Lat: 41.110579°, Long: -80.831781°, Rebar located ~ 7.5" below pavement surface.

Date: 2/12/2025

Photographer: KAH

15	Boring	B-008-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

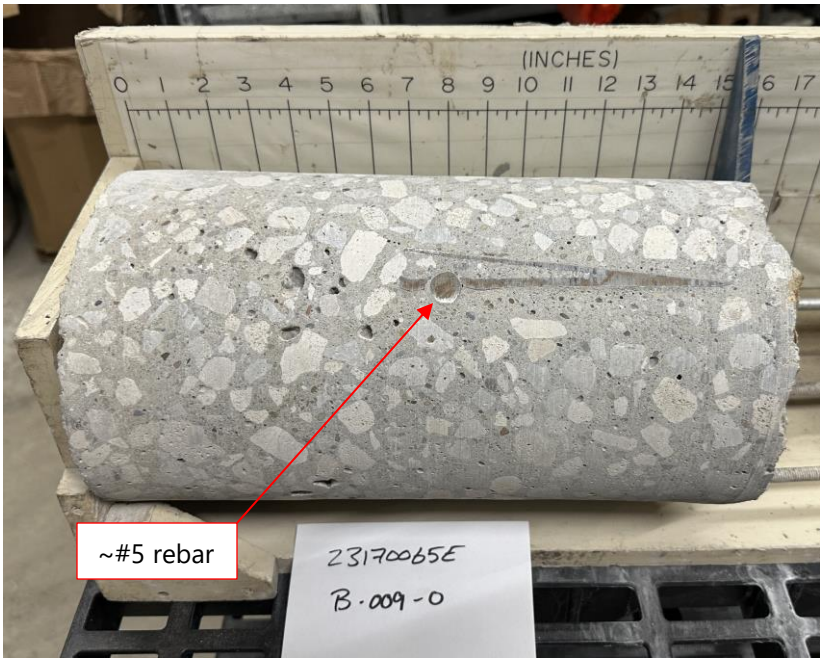
Photographer: BJB

16	Boring	B-008-0
	Remarks	Lat: 41.110493°, Long: -80.830308°

Date: 2/12/2025

Photographer: KAH

17	Boring	B-009-0
	Remarks	I-80 Westbound Inside Shoulder



Date: 2/12/2025

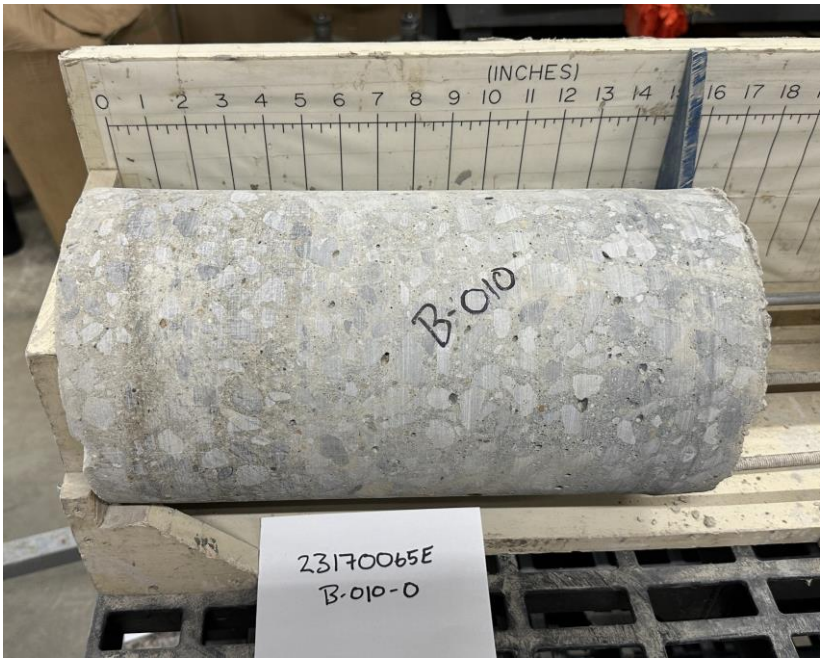
Photographer: KAH

18	Boring	B-009-0
	Remarks	Lat: 41.110823°, Long: -80.828999°, Rebar located ~8" below pavement surface.

Date: 2/12/2025

Photographer: KAH

19	Boring	B-010-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

Photographer: BJB

20	Boring	B-010-0
	Remarks	Lat: 41.110744°, Long: -80.827478°

Date: 2/12/2025

Photographer: KAH

21	Boring	B-011-0
	Remarks	I-80 Eastbound Inside Shoulder

Date: 2/12/2025

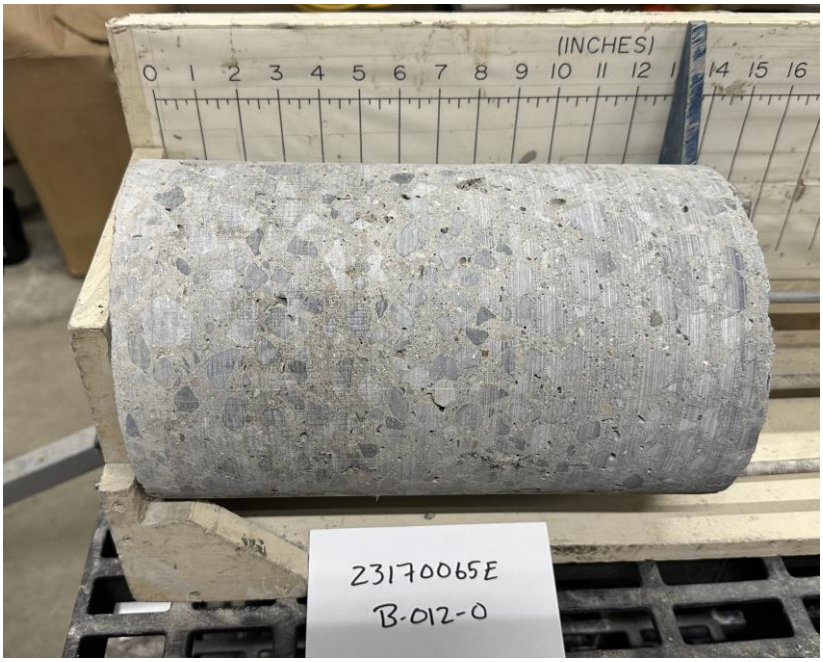
Photographer: BJB

22	Boring	B-011-0
	Remarks	Lat: 41.111068°, Long: -80.823805°

Date: 2/12/2025

Photographer: KAH

23	Boring	B-012-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

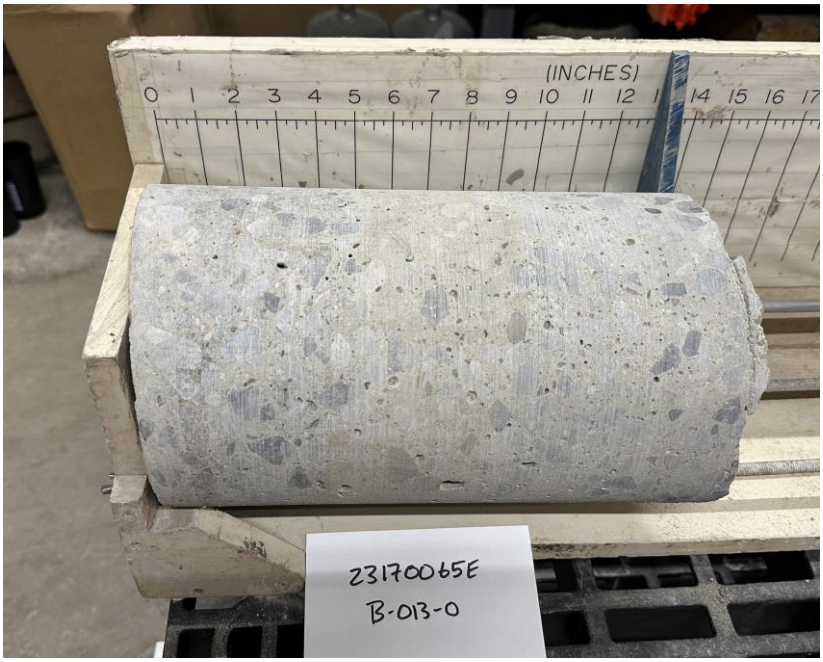
Photographer: BJB

24	Boring	B-012-0
	Remarks	Lat: 41.111671°, Long: -80.820311°

Date: 2/12/2025

Photographer: KAH

25	Boring	B-013-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

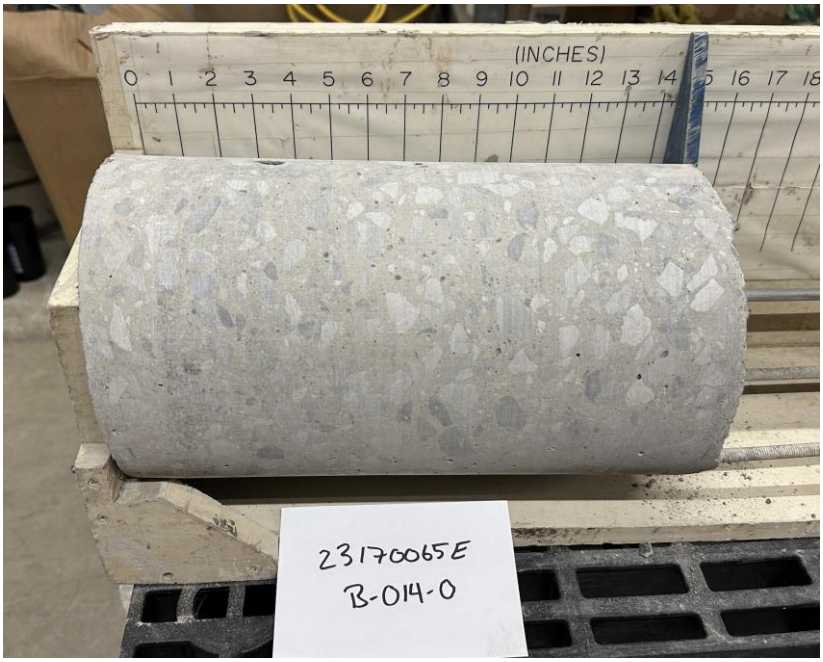
Photographer: BJB

26	Boring	B-013-0
	Remarks	Lat: 41.111623°, Long: -80.816507°

Date: 2/12/2025

Photographer: KAH

27	Boring	B-014-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

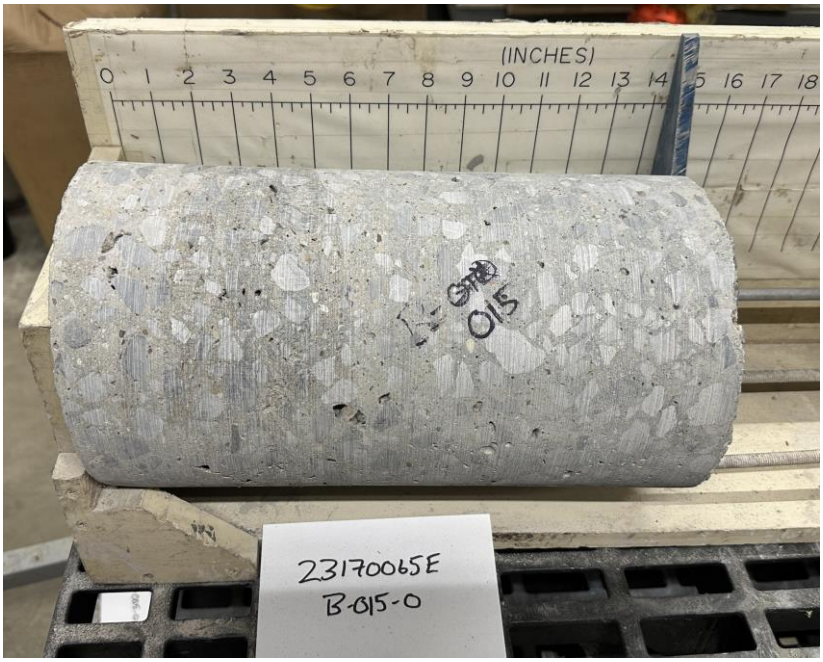
Photographer: KAH

28	Boring	B-014-0
	Remarks	Lat: 41.115109°, Long: -80.805769°

Date: 2/12/2025

Photographer: KAH

29	Boring	B-015-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 3/19/2025

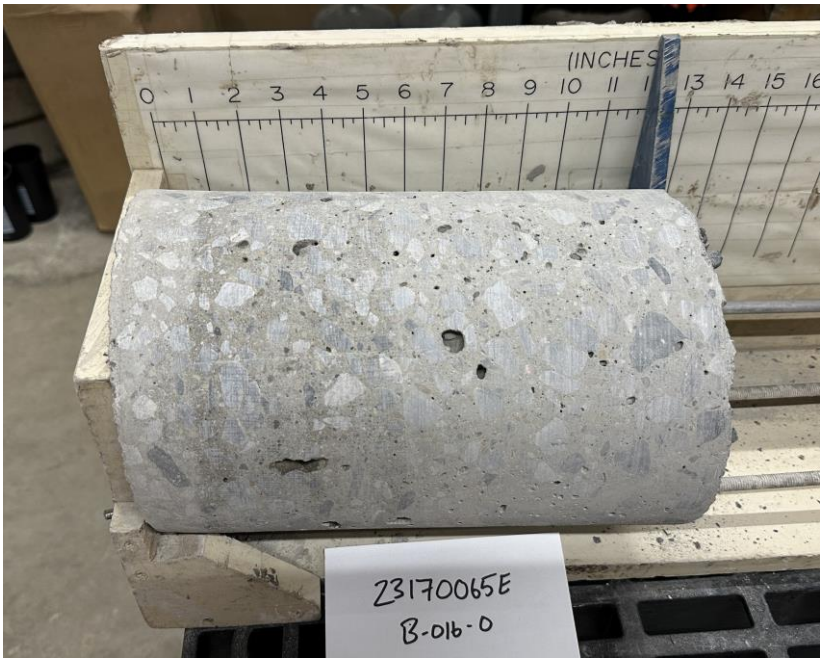
Photographer: KAH

30	Boring	B-015-0
	Remarks	Lat: 41.116721°, Long: -80.802776°

Date: 2/12/2025

Photographer: KAH

31	Boring	B-016-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

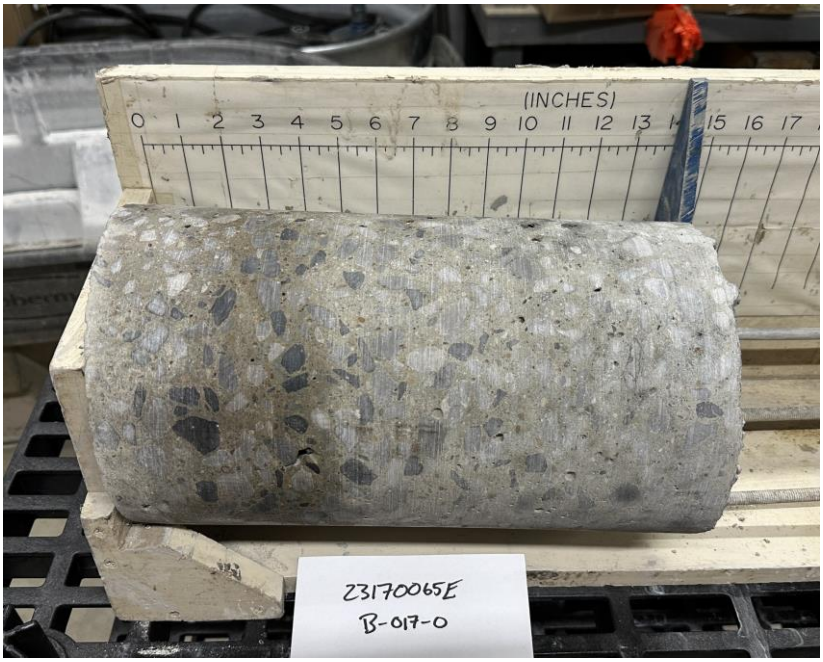
Photographer: BJB

32	Boring	B-016-0
	Remarks	Lat: 41.117758°, Long: -80.799377°

Date: 2/12/2025

Photographer: KAH

33	Boring	B-017-0 Core
	Remarks	I-80 Eastbound Inside Shoulder



Date: 3/19/2025

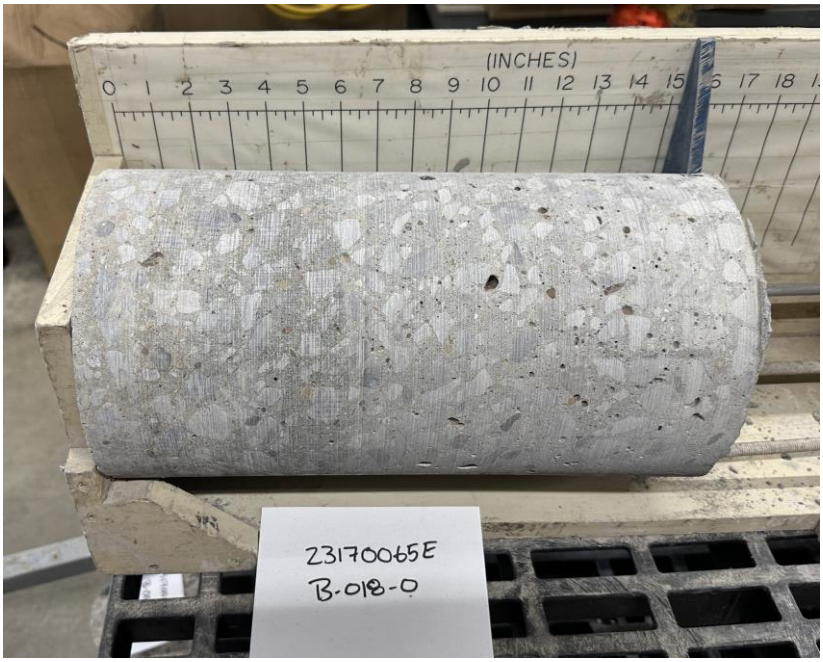
Photographer: BJB

34	Boring	B-017-0 Core
	Remarks	Lat: 41.11904°, Long: -80.796147°. Dark layer line due to moisture from wiping cloth prior to photo.

Date: 2/12/2025

Photographer: KAH

35	Boring	B-018-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

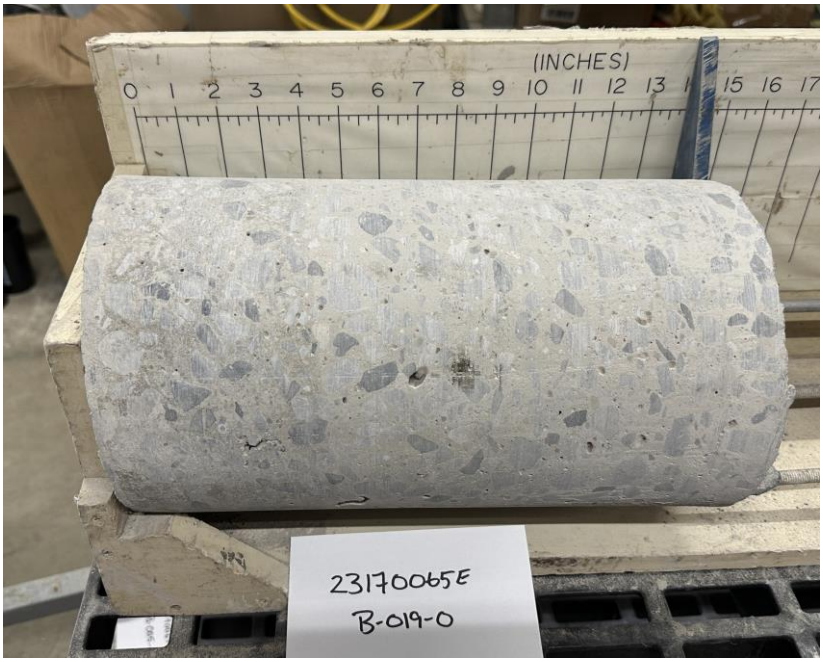
Photographer: BJB

36	Boring	B-018-0
	Remarks	Lat: 41.120619°, Long: -80.792904°

Date: 2/12/2025

Photographer: KAH

37	Boring	B-019-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

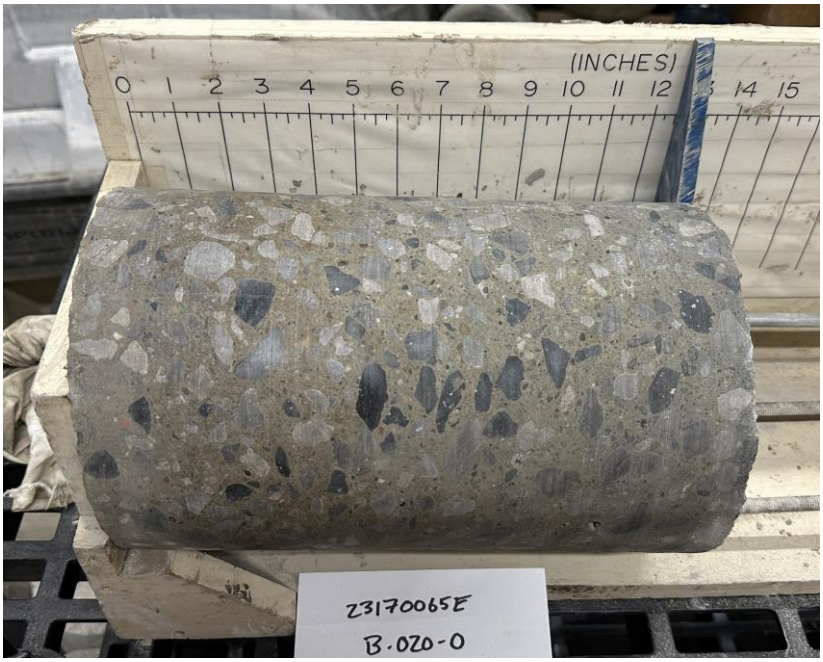
Photographer: BJB

38	Boring	B-019-0
	Remarks	Lat: 41.121556°, Long: -80.789799°

Date: 2/12/2025

Photographer: KAH

39	Boring	B-020-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

Photographer: BJB

40	Boring	B-020-0
	Remarks	Lat: 41.122651°, Long: -80.786401°. Darker color due to moisture from wiping cloth prior to photo.

Date: 2/12/2025

Photographer: KAH

41	Boring	B-021-0
	Remarks	I-80 Westbound Outside Shoulder

Date: 2/12/2025

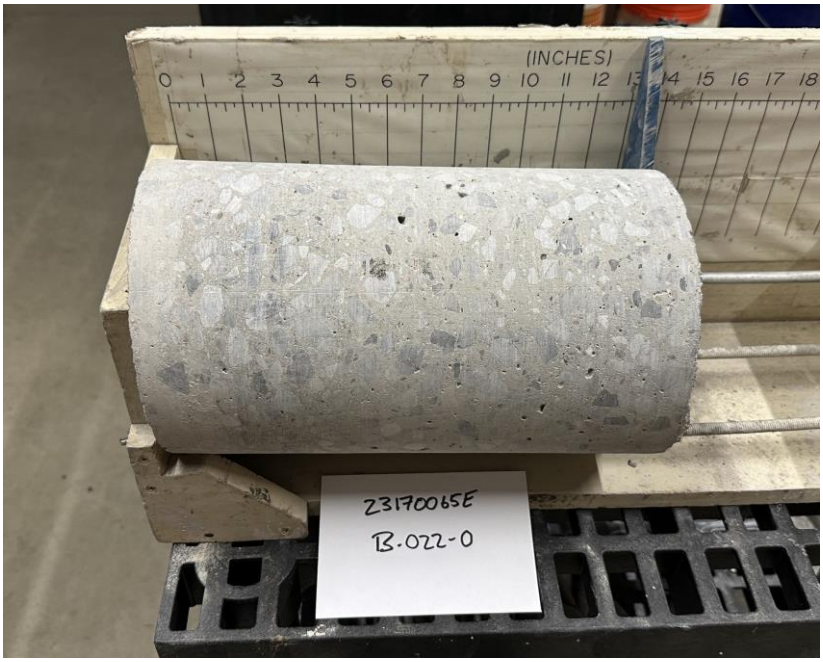
Photographer: BJB

42	Boring	B-021-0
	Remarks	Lat: 41.123619°, Long: -80.782926°

Date: 2/12/2025

Photographer: KAH

43	Boring	B-022-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

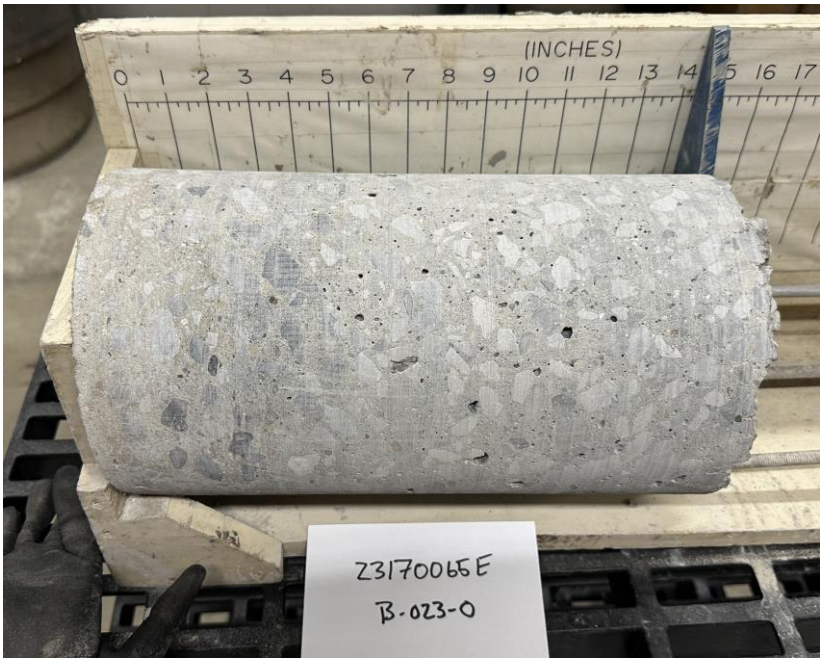
Photographer: BJB

44	Boring	B-022-0
	Remarks	Lat: 41.123694°, Long: -80.779254°

Date: 2/12/2025

Photographer: KAH

45	Boring	B-023-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 2/12/2025

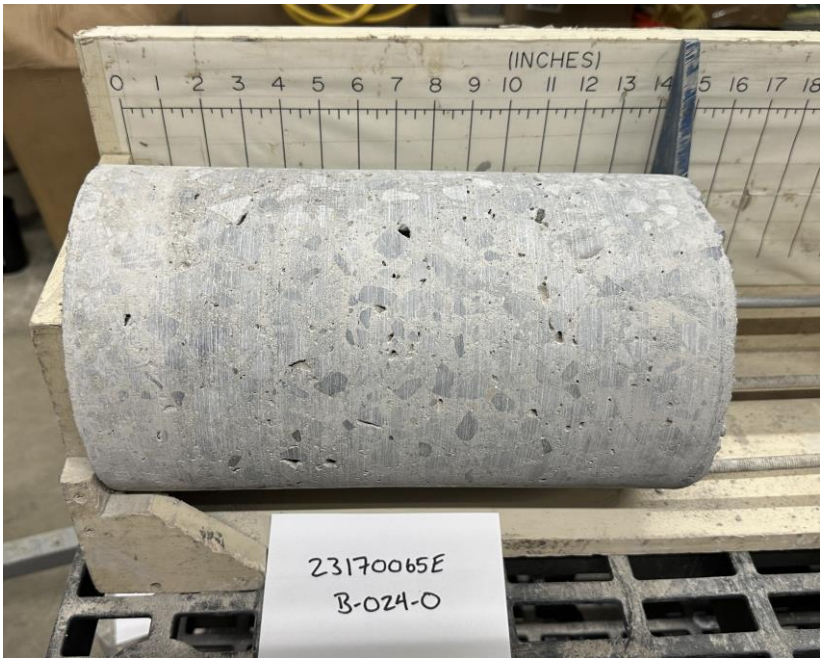
Photographer: BJB

46	Boring	B-023-0
	Remarks	Lat: 41.123724°, Long: -80.775662°

Date: 2/12/2025

Photographer: KAH

47	Boring	B-024-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

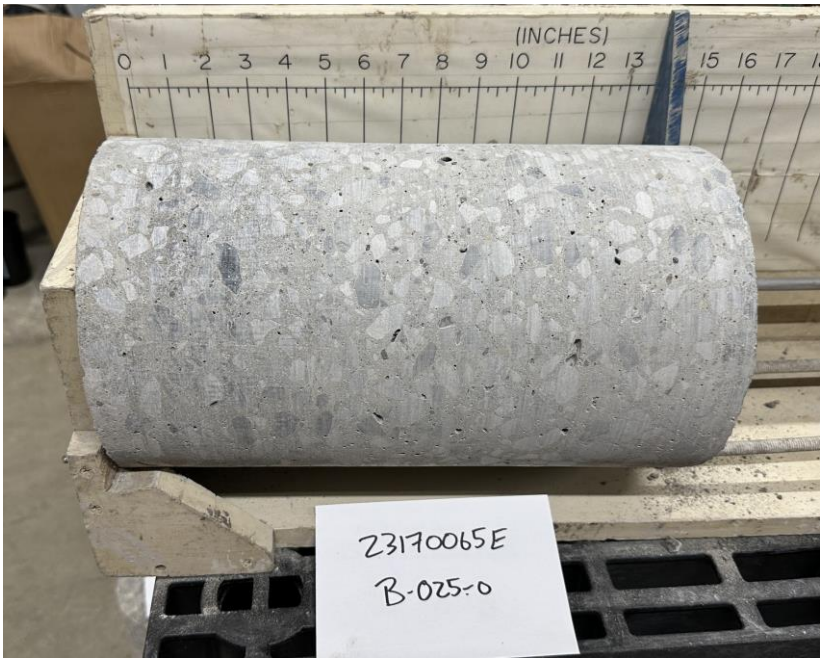
Photographer: KAH

48	Boring	B-024-0
	Remarks	Lat: 41.12399°, Long: -80.772038°

Date: 2/12/2025

Photographer: KAH

49	Boring	B-025-0
	Remarks	I-80 Eastbound Inside Shoulder



Date: 3/19/2025

Photographer: BJB

50	Boring	B-025-0
	Remarks	Lat: 41.123742°, Long: -80.768731°

Date: 2/12/2025

Photographer: KAH

51	Boring	B-026-0
	Remarks	I-80 Eastbound Inside Shoulder

Date 3/19/2025

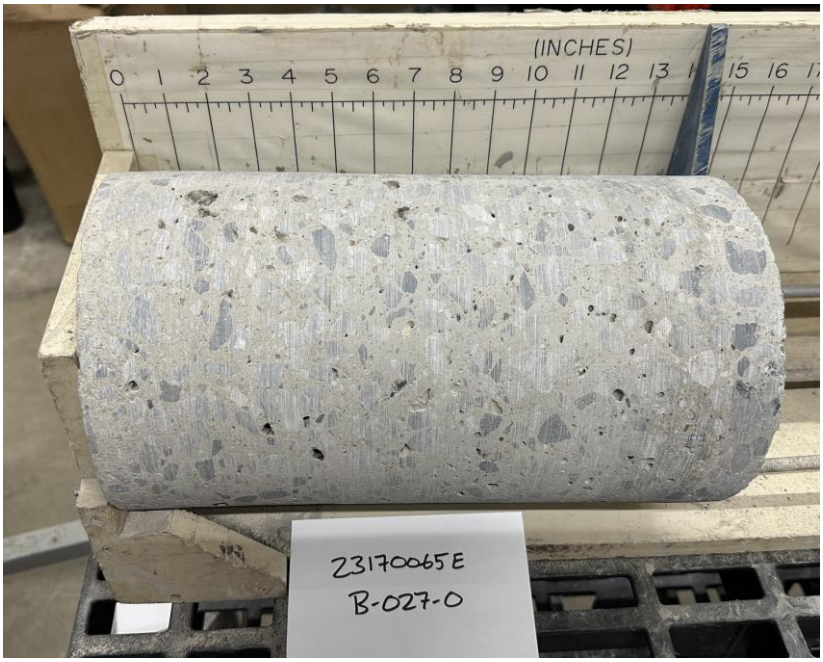
Photographer: BJB

52	Boring	B-026-0
	Remarks	Lat: 41.123751°, Long: -80.765833°. Top 1" layer of asphalt separated upon core removal.

Date: 2/12/2025

Photographer: KAH

53	Boring	B-027-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

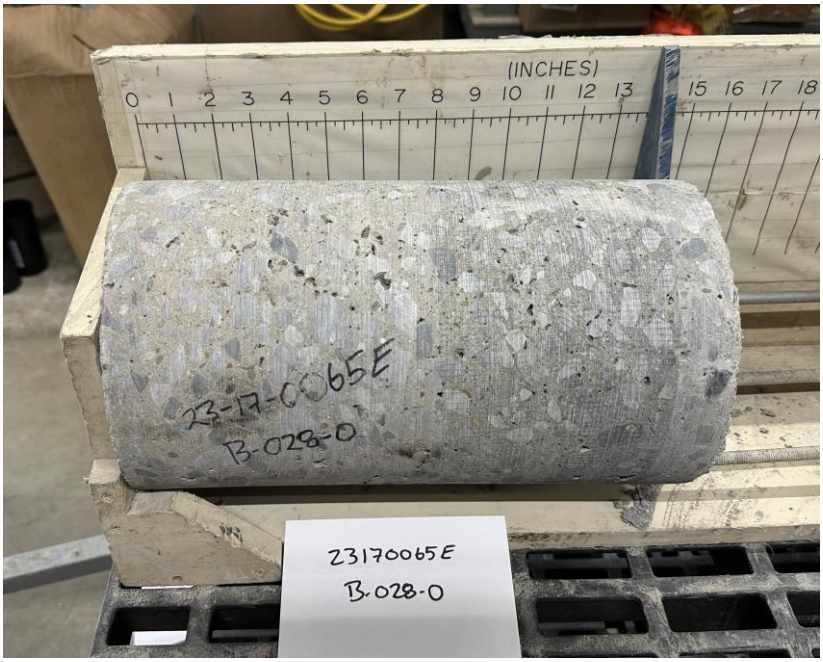
Photographer: BJB

54	Boring	B-027-0
	Remarks	Lat: 41.124229°, Long: -80.758246°

Date: 2/12/2025

Photographer: KAH

55	Boring	B-028-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

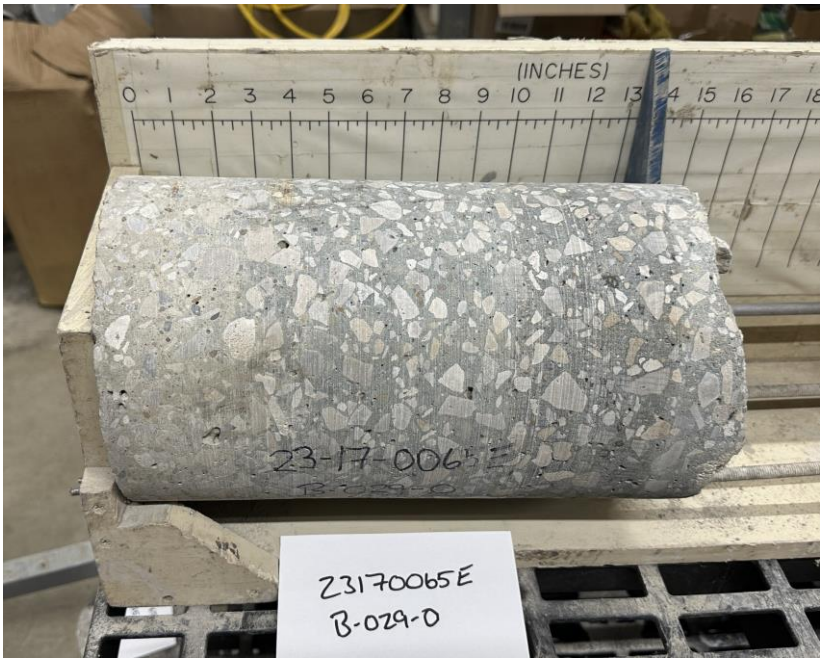
Photographer: KAH

56	Boring	B-028-0
	Remarks	Lat: 41.12604°, Long: -80.751561°

Date: 2/12/2025

Photographer: KAH

57	Boring	B-029-0
	Remarks	I-80 Westbound Outside Shoulder



Date: 2/12/2025

Photographer: KAH

58	Boring	B-029-0
	Remarks	Lat: 41.1293°, Long: -80.746298°

GRANULAR BASE PHOTOS

Date: 5/7/2025

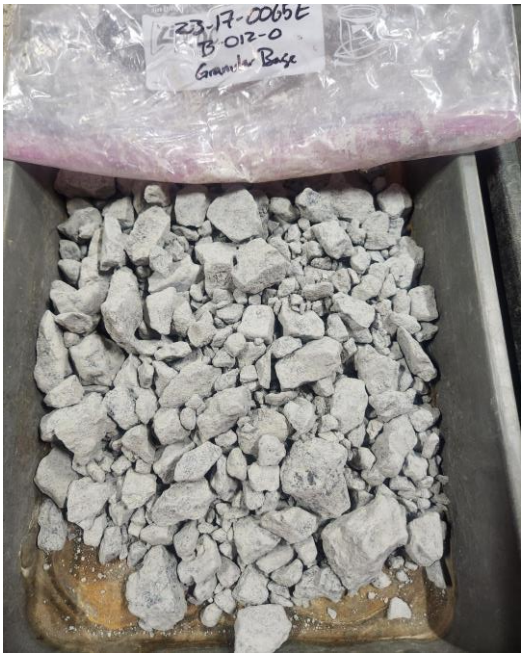
Photographer: KC

1	Boring	B-010-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

2	Boring	B-011-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments



Date: 5/7/2025

Photographer: KC

3	Boring	B-012-0-25
	Granular Base Desc.	Light gray GRAVEL WITH SAND, trace silt, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

4	Boring	B-013-0-25
	Granular Base Desc.	Gray GRAVEL, little sand, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

5	Boring	B-014-0-25
	Granular Base Desc.	Gray GRAVEL, little sand, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

6	Boring	B-015-0-25
	Granular Base Desc.	Gray GRAVEL, some sand, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

7	Boring	B-016-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

8	Boring	B-017-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, some silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

9	Boring	B-018-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

10	Boring	B-019-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

11	Boring	B-020-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

12	Boring	B-021-0-25
	Granular Base Desc.	Gray GRAVEL, little sand, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

13	Boring	B-022-0-25
	Granular Base Desc.	Gray GRAVEL, trace sand, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

14	Boring	B-023-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

15	Boring	B-024-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

16	Boring	B-025-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, some silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

17	Boring	B-026-0-25
	Granular Base Desc.	Brown GRAVEL, little sand, trace silty clay, few slag pieces, no concrete fragments

Date: 5/7/2025

Photographer: KC

18	Boring	B-027-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

19	Boring	B-028-0-25
	Granular Base Desc.	Gray GRAVEL WITH SAND, little silty clay, no slag or concrete fragments

Date: 5/7/2025

Photographer: KC

20	Boring	B-029-0-25
	Granular Base Desc.	Grayish brown GRAVEL WITH SAND, little silty clay, no slag, few broken concrete fragments

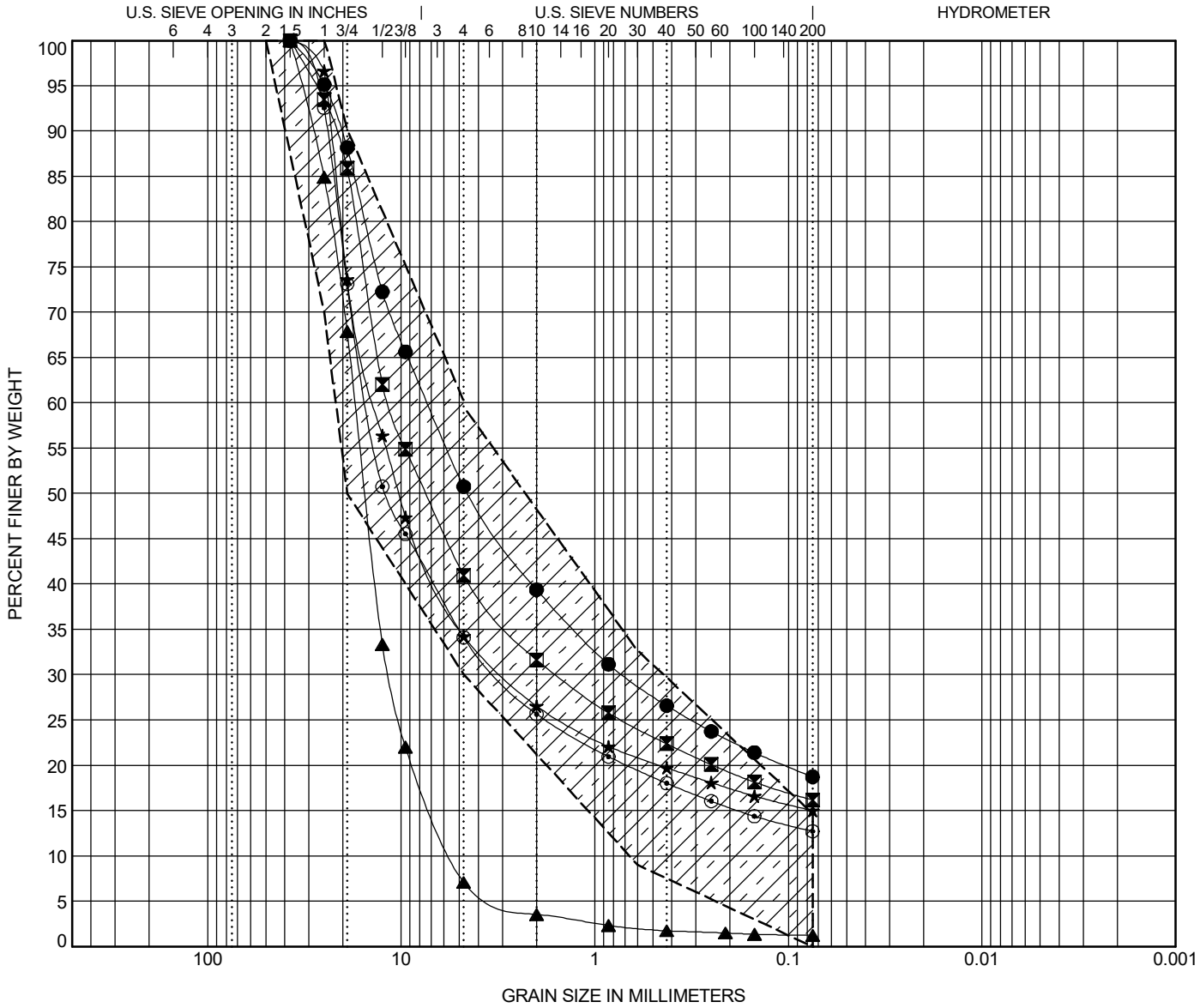
GRANULAR BASE GRAIN SIZE DISTRIBUTION PLOTS

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016
Telephone: 614.793.2226

GRAIN SIZE DISTRIBUTION

PROJECT MAH-76/80-8.50/0.00 **PID** 122947

OGE NUMBER MAH-76/80-8.50/0.00 **PROJECT TYPE** SUBGRADE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID / Sample ID	Classification	LL	PL	PI	Cc	Cu
●	**B-010-0-25**						
⊠	**B-011-0-25**						
▲	**B-012-0-25**					**1.42**	**3.17**
★	**B-013-0-25**						
⊙	**B-014-0-25**						

	Boring ID / Sample ID	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-010-0-25**	**37.5**	**24.857**	**4.484**		**60**	**21**	**19**	
⊠	**B-011-0-25**	**37.5**	**27.437**	**7.453**		**69**	**15**	**16**	
▲	**B-012-0-25**	**37.5**	**32.792**	**15.297**	**5.445**	**97**	**2**	**1**	
★	**B-013-0-25**	**37.5**	**24.516**	**10.295**		**73**	**12**	**15**	
⊙	**B-014-0-25**	**37.5**	**28.551**	**12.014**		**74**	**13**	**13**	

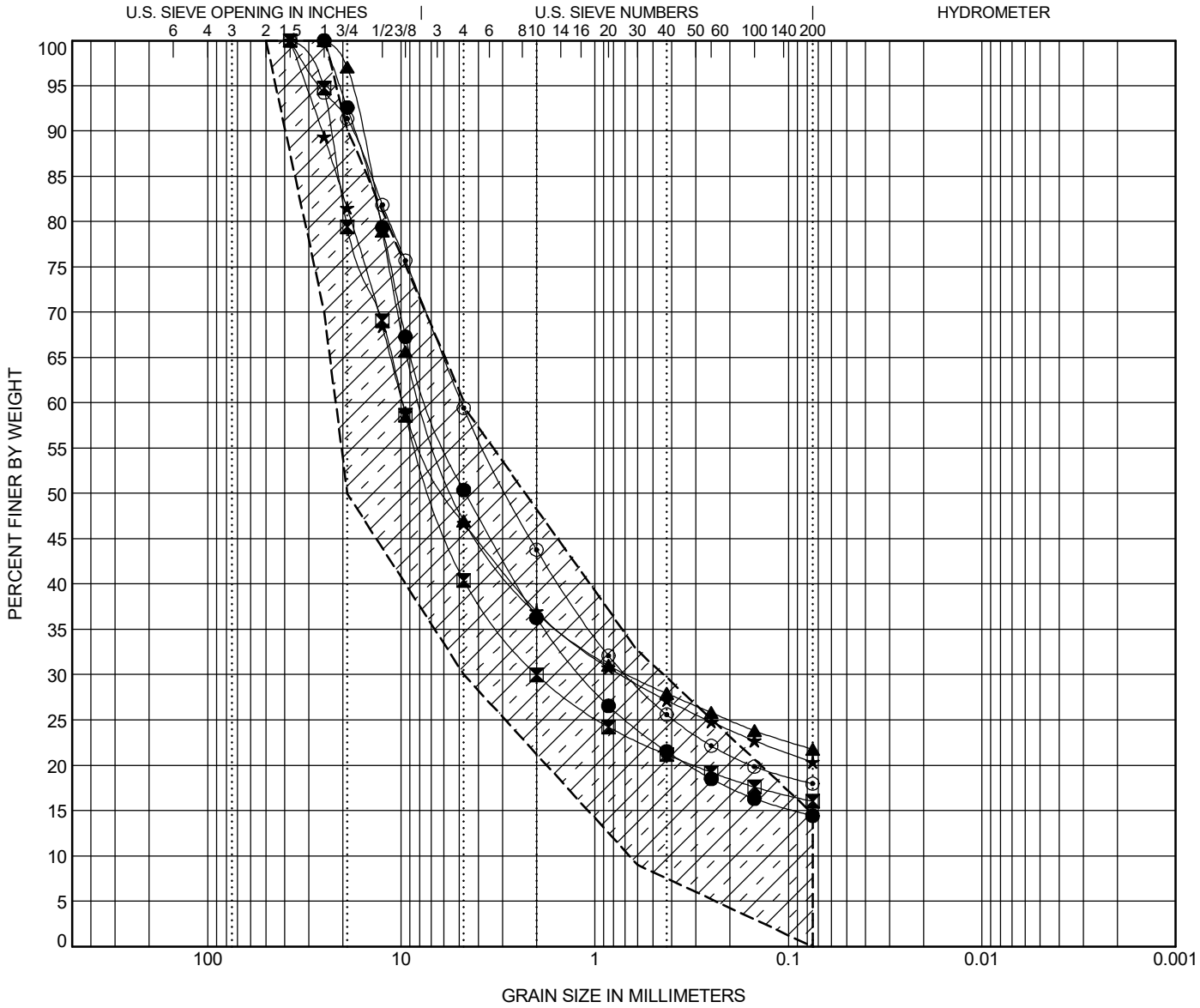
GRAIN SIZE - ITEM 304 - OH DOT.GDT - 5/13/25 08:37 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016
Telephone: 614.793.2226

GRAIN SIZE DISTRIBUTION

PROJECT MAH-76/80-8.50/0.00 **PID** 122947

OGE NUMBER MAH-76/80-8.50/0.00 **PROJECT TYPE** SUBGRADE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID / Sample ID	Classification	LL	PL	PI	Cc	Cu
●	**B-015-0-25**						
⊠	**B-016-0-25**						
▲	**B-017-0-25**						
★	**B-018-0-25**						
⊙	**B-019-0-25**						

	Boring ID / Sample ID	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-015-0-25**	**25**	**20.769**	**4.645**		**64**	**22**	**14**	
⊠	**B-016-0-25**	**37.5**	**25.484**	**6.837**		**70**	**14**	**16**	
▲	**B-017-0-25**	**25**	**18.114**	**5.314**		**63**	**15**	**22**	
★	**B-018-0-25**	**37.5**	**30.984**	**5.733**		**63**	**17**	**20**	
⊙	**B-019-0-25**	**37.5**	**26.365**	**2.82**		**56**	**26**	**18**	

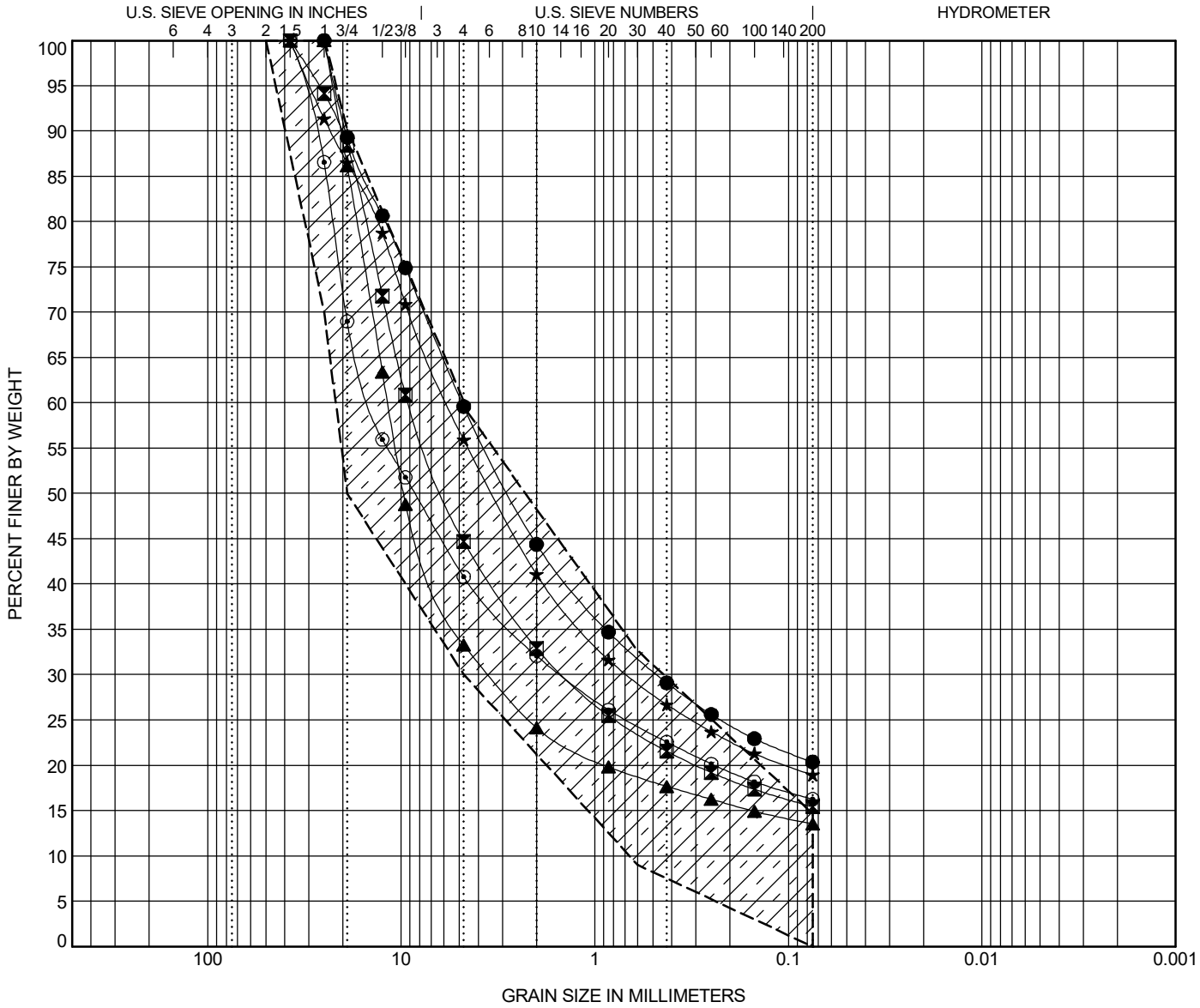
GRAIN SIZE - ITEM 304 - OH DOT.GDT - 5/13/25 08:37 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016
Telephone: 614.793.2226

GRAIN SIZE DISTRIBUTION

PROJECT MAH-76/80-8.50/0.00 **PID** 122947

OGE NUMBER MAH-76/80-8.50/0.00 **PROJECT TYPE** SUBGRADE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID / Sample ID	Classification	LL	PL	PI	Cc	Cu
●	**B-020-0-25**						
⊠	**B-021-0-25**						
▲	**B-022-0-25**						
★	**B-023-0-25**						
⊙	**B-024-0-25**						

	Boring ID / Sample ID	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-020-0-25**	**25**	**21.982**	**2.753**		**56**	**24**	**20**	
⊠	**B-021-0-25**	**37.5**	**26.514**	**5.965**		**68**	**17**	**15**	
▲	**B-022-0-25**	**25**	**22.633**	**9.717**		**76**	**10**	**14**	
★	**B-023-0-25**	**37.5**	**29.638**	**3.364**		**59**	**22**	**19**	
⊙	**B-024-0-25**	**37.5**	**32.247**	**8.493**		**69**	**15**	**16**	

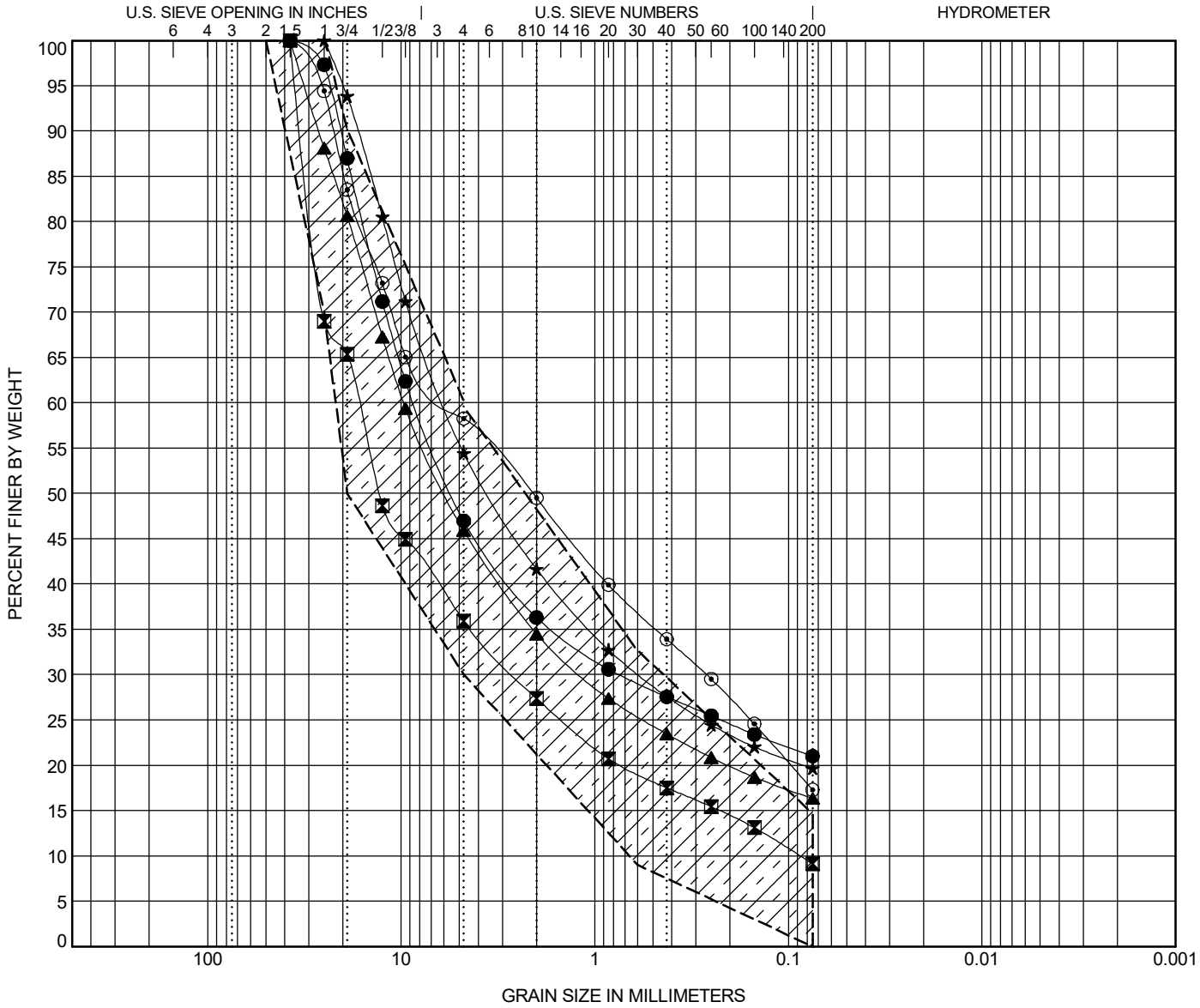
GRAIN SIZE - ITEM 304 - OH DOT.GDT - 5/13/25 08:37 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016
Telephone: 614.793.2226

GRAIN SIZE DISTRIBUTION

PROJECT MAH-76/80-8.50/0.00 **PID** 122947

OGE NUMBER MAH-76/80-8.50/0.00 **PROJECT TYPE** SUBGRADE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring ID / Sample ID	Classification	LL	PL	PI	Cc	Cu
●	**B-025-0-25**						
⊠	**B-026-0-25**					**4.69**	**189.74**
▲	**B-027-0-25**						
★	**B-028-0-25**						
⊙	**B-029-0-25**						

	Boring ID / Sample ID	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-025-0-25**	**37.5**	**23.504**	**5.447**		**63**	**16**	**21**	
⊠	**B-026-0-25**	**37.5**	**35.125**	**12.931**	**0.088**	**73**	**18**	**9**	
▲	**B-027-0-25**	**37.5**	**31.619**	**5.861**		**66**	**18**	**16**	
★	**B-028-0-25**	**25**	**19.992**	**3.516**		**58**	**22**	**20**	
⊙	**B-029-0-25**	**37.5**	**26.065**	**2.098**		**50**	**33**	**17**	

GRAIN SIZE - ITEM 304 - OH DOT.GDT - 5/13/25 08:37 - R:\SERVICE LINES\CS-2557\COLUMBUS\GINTW\PROJECTS\23170065E MAH-76_80.GPJ

Appendix D – Subgrade Analysis

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Design Manual Section 600

MAH-76/80-8.50/0.00
PID 122947

PROJECT DESCRIPTION - A portion of existing pavement of IR 76/IR 80 has experienced premature deterioration and is to be completely replaced.

S&ME, Inc.

Prepared By: Kevin Harper/Brian K. Sears, PE
Date prepared: Wednesday, May 21, 2025

S&ME, Inc.
6190 Enterprise Court
Dublin, OH 43016

614-793-2226
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NO. OF BORINGS: 79

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-25	IR 76	447+77	41	Left	OTB Simco 2800	89	989.5	987.5	2.0 C
2	B-002-0-25	IR 76	452+04	38	Right	OTB Simco 2800	89	983.9	981.9	2.0 C
3	B-003-0-25	IR 76	456+07	41	Left	OTB Simco 2800	89	980.9	978.9	2.0 C
4	B-004-0-25	IR 76	460+09	38	Right	OTB Simco 2800	89	978.0	976.0	2.0 C
5	B-005-0-25	IR 76	463+95	41	Left	OTB Simco 2800	89	975.8	973.8	2.0 C
6	B-006-0-25	IR 76	468+05	38	Right	OTB Simco 2800	89	973.0	971.0	2.0 C
7	B-007-0-25	IR 76	472+02	41	Left	OTB Simco 2800	89	970.5	968.5	2.0 C
8	B-008-0-25	IR 76	476+13	37	Right	OTB Simco 2800	89	967.5	965.5	2.0 C
9	B-009-0-25	IR 76	479+80	41	Left	OTB Simco 2800	89	965.2	963.2	2.0 C
10	RB-001-0-02	IR 80	483+50	30	Left		60	963.1	960.7	2.4 C
11	B-010-0-25	IR 80	483+94	35	Right	OTB Simco 2800	89	962.5	960.5	2.0 C
12	RB-002-0-02	IR 80	487+50	30	Right		60	959.5	958.6	0.9 C
13	RB-003-0-02	IR 80	491+50	30	Left		60	955.0	955.7	0.7 F
14	B-011-0-25	IR 80	494+13	35	Right	OTB Simco 2800	89	953.2	951.2	2.0 C
15	LRB-001-0-02	IR 80	495+08	11	Right		60	950.3	949.9	0.4 C
16	LRB-005-0-02	IR 80	496+79	1	Left		60	947.4	947.1	0.3 C
17	R-001-0-02	IR 80	500+63	28	Right	CME-55	60	941.9	940.8	1.1 C
18	B-012-0-25	IR 80	503+95	72	Left	OTB Simco 2800	89	937.1	935.1	2.0 C
19	R-002-0-02	IR 80	504+63	32	Left	CME-55	60	935.3	934.3	1.0 C
20	R-003-0-02	IR 80	508+65	29	Right	CME-55	60	928.3	927.8	0.5 C
21	R-004-0-02	IR 80	512+77	24	Left	CME-55	60	921.7	921.1	0.6 C
22	B-013-0-25	IR 80	514+16	127	Right	OTB Simco 2800	89	920.4	918.4	2.0 C
23	R-005-0-02	IR 80	516+98	28	Right	CME-55	60	917.5	918.0	0.5 F
24	B-014-0-25	IR 80	546+21	126	Right	OTB Simco 2800	89	921.5	919.5	2.0 C
25	R-006-0-02	IR 80	546+34	21	Left	CME-55	60	918.0	919.8	1.8 F
26	R-007-0-02	IR 80	550+39	34	Right	CME-55	60	918.3	917.9	0.4 C
27	R-008-0-02	IR 80	554+32	34	Left	CME-55	60	918.3	916.5	1.8 C
28	B-015-0-25	IR 80	556+15	72	Left	OTB Simco 2800	89	917.0	915.0	2.0 C
29	R-009-0-02	IR 80	558+22	33	Right	CME-55	60	918.3	915.7	2.6 C
30	R-010-0-02	IR 80	562+22	32	Left	CME-55	60	918.6	916.5	2.1 C
31	R-011-0-02	IR 80	566+20	35	Right	CME-55	60	919.2	918.5	0.7 C
32	B-016-0-25	IR 80	566+27	23	Right	OTB Simco 2800	89	920.5	918.5	2.0 C
33	R-012-0-02	IR 80	570+19	29	Left	CME-55	60	922.9	923.0	0.1 F
34	R-013-0-02	IR 80	574+21	33	Right	CME-55	60	929.5	928.9	0.6 C
35	B-017-0-25	IR 80	576+32	23	Right	OTB Simco 2800	89	934.2	932.2	2.0 C
36	R-014-0-02	IR 80	578+16	33	Left	CME-55	60	936.3	935.6	0.7 C
37	TRB-005-0-02	IR 80	586+30	7	Left		60	949.7	950.1	0.4 F
38	B-018-0-25	IR 80	586+90	72	Left	OTB Simco 2800	89	952.5	950.5	2.0 C
39	R-015-0-02	IR 80	590+22	34	Right	CME-55	60	956.8	956.8	0.0
40	R-016-0-02	IR 80	594+16	34	Left	CME-55	60	964.6	963.7	0.9 C
41	B-019-0-25	IR 80	596+07	23	Right	OTB Simco 2800	89	968.9	966.9	2.0 C
42	R-017-0-02	IR 80	598+14	33	Right	CME-55	60	974.0	972.4	1.6 C
43	R-018-0-02	IR 80	602+24	33	Left	CME-55	60	986.2	984.6	1.6 C
44	R-019-0-02	IR 80	606+14	35	Right	CME-55	60	996.7	996.2	0.5 C
45	B-020-0-25	IR 80	606+29	23	Right	OTB Simco 2800	89	998.2	996.2	2.0 C

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
46	R-020-0-02	IR 80	610+35	20	Left	CME-55	60	1008.8	1008.5	0.3 C
47	R-021-0-02	IR 80	614+55	34	Right	CME-55	60	1020.0	1020.8	0.8 F
48	B-021-0-25	IR 80	616+42	71	Left	OTB Simco 2800	89	1029.3	1027.3	2.0 C
49	R-022-0-02	IR 80	625+50	30	Left	CME-55	60	1045.9	1045.2	0.7 C
50	B-022-0-25	IR 80	626+47	23	Right	OTB Simco 2800	89	1046.4	1044.4	2.0 C
51	R-023-0-02	IR 80	629+46	26	Right	CME-55	60	1049.6	1047.0	2.6 C
52	R-024-0-02	IR 80	634+09	34	Left	CME-55	60	1048.0	1047.0	1.0 C
53	B-023-0-25	IR 80	636+38	23	Right	OTB Simco 2800	89	1048.2	1046.2	2.0 C
54	R-025-0-02	IR 80	638+10	35	Right	CME-55	60	1047.5	1045.1	2.4 C
55	R-026-0-02	IR 80	641+91	29	Left	CME-55	60	1037.8	1037.6	0.2 C
56	R-027-0-02	IR 80	646+06	34	Right	CME-55	60	1035.0	1034.0	1.0 C
57	B-024-0-25	IR 80	646+37	70	Left	OTB Simco 2800	89	1033.7	1031.7	2.0 C
58	R-028-0-02	IR 80	650+01	31	Left	CME-55	60	1027.6	1029.1	1.5 F
59	R-029-0-02	IR 80	653+89	33	Right	CME-55	60	1028.5	1027.3	1.2 C
60	B-025-0-25	IR 80	655+47	23	Right	OTB Simco 2800	89	1030.5	1028.5	2.0 C
61	R-030-0-02	IR 80	657+97	31	Left	CME-55	60	1032.5	1031.6	0.9 C
62	R-031-0-02	IR 80	661+92	22	Right	CME-55	60	1036.7	1035.8	0.9 C
63	B-026-0-25	IR 80	663+46	22	Right	OTB Simco 2800	89	1039.2	1037.2	2.0 C
64	R-032-0-02	IR 80	665+89	29	Left	CME-55	60	1040.6	1040.0	0.6 C
65	R-033-0-02	IR 80	669+87	17	Right	CME-55	60	1044.7	1044.2	0.5 C
66	R-034-0-02	IR 80	673+85	26	Left	CME-55	60	1048.7	1048.2	0.5 C
67	R-035-0-02	IR 80	677+80	92	Right	CME-55	60	1053.6	1052.6	1.0 C
68	R-036-0-02	IR 80	681+75	49	Right	CME-55	60	1058.3	1056.7	1.6 C
69	B-027-0-25	IR 80				OTB Simco 2800	89	1061.3	1059.3	2.0 C
70	R-037-0-02	IR 80	685+35	178	Right	CME-55	60	1057.2	1060.6	3.4 F
71	R-038-0-02	IR 80	689+35	24	Right	CME-55	60	1066.9	1064.0	2.9 C
72	R-040-0-02	IR 80	700+92	18	Right	CME-55	60	1057.2	1055.2	2.0 C
73	B-028-0-25	IR 80				OTB Simco 2800	89	1054.4	1052.4	2.0 C
74	R-042-0-02	IR 80	708+75	23	Right	CME-55	60	1058.1	1056.4	1.7 C
75	RB-006-0-02	IR 80	712+15	140	Right		60	1060.3	1057.7	2.6 C
76	RB-007-0-02	IR 80	716+72	48	Right		60	1057.3	1055.2	2.1 C
77	RB-008-0-02	IR 80	720+25	25	Right		60	1052.7	1050.8	1.9 C
78	RB-009-0-02	IR 80	723+00	30	Right		60	1049.4	1047.4	2.0 C
79	B-029-0-25	IR 80				OTB Simco 2800	89	1049.3	1047.3	2.0 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	2.0	3.5	0.0	1.5	19						5	1	6	10	6	A-1-a	0						
	001-0	SS-2	3.5	3.8	1.5	1.8	50									4	0	Rock	0						
	25																								
								19																	
2	B	SS-1	2.0	3.5	0.0	1.5	33			NP	NP	NP	5	1	6	41	6	A-1-b	0						
	002-0	SS-2	3.5	4.4	1.5	2.4	50		4.5	31	19	12	22	17	39	13	14	A-6a	1	600					
	25	SS-3	5.0	5.3	3.0	3.3	50									7	0	Rock	0						
		SS-4	6.5	6.8	4.5	4.8	50	30								6	0	Rock	0						
3	B	SS-1	2.0	3.5	0.0	1.5	7						4	1	5	6	6	A-1-a	0						
	003-0	SS-2	3.5	3.7	1.5	1.7	50									11	0	Rock	0						
	25																								
								7																	
4	B	SS-1	2.0	3.5	0.0	1.5	33			NP	NP	NP	17	4	21	9	8	A-3a	0						
	004-0	SS-2	3.5	5.0	1.5	3.0	24			NP	NP	NP	22	4	26	12	8	A-3a	0	152					
	25	SS-3A	5.0	5.5	3.0	3.5	21									13	14	A-6a	10						
		SS-3B	5.5	6.5	3.5	4.5	21	21								14	10	A-4a	8						
5	B	SS-1A	2.0	2.7	0.0	0.7	9						7	3	10	11	8	A-3a	0						
	005-0	SS-1B	2.7	3.5	0.7	1.5	9									23	8	A-3	0						
	25	SS-2	3.5	5.0	1.5	3.0	28			NP	NP	NP	14	5	19	18	8	A-3a	0	976					
		SS-3A	5.0	6.0	3.0	4.0	27	9		18	12	6	48	19	67	20	10	A-4a	6						
6	B	SS-1	2.0	3.5	0.0	1.5	27		3	23	14	9	30	14	44	13	10	A-4a	2			Mc			CMS Item 204.03
	006-0	SS-2	3.5	4.8	1.5	2.8	50			18	13	5	44	23	67	8	10	A-4a	6	1344					
	25																								
								27																	
7	B	SS-1A	2.0	2.7	0.0	0.7	44						2	2	4	5	6	A-1-a	0						
	007-0	SS-1B	2.7	3.5	0.7	1.5	44						19	6	25	19	6	A-1-b	0						
	25	SS-2	3.5	3.8	1.5	1.8	50									3	0	Rock	0						
								30																	
8	B	SS-1	2.0	3.3	0.0	1.3	50			25	22	3	19	7	26	9	10	A-2-4	0	248					
	008-0	SS-2	3.5	3.9	1.5	1.9	50									3	0	Rock	0						
	25																								
								30																	
9	B	SS-1A	2.0	3.1	0.0	1.1	50						2	2	4	5	6	A-1-a	0	360					
	009-0	SS-1B	3.1	3.3	1.1	1.3	50									3	0	Rock	0						
	25																								
								30																	

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	RB	SS-2	1.5	3.0	-0.9	0.6	19			29	18	11	20	19	39		14	A-6a	1						
	-001-0	SS-3	3.0	4.5	0.6	2.1	27			39	19	20	44	44	88		16	A-6b	12						
	-02	SS-4	4.5	7.2	2.1	4.8	46										16	A-6b	16						
		SS-5	7.2	10.0	4.8	7.6	28	19		29	18	11	28	28	56		14	A-6a	5						
11	B	SS-1	2.0	3.5	0.0	1.5	52									16	10	A-4a	8			Mc			
	010-0	SS-2	3.5	5.0	1.5	3.0	31		4.5	28	17	11	26	19	45	12	14	A-6a	2	976					
	25	SS-3	5.0	5.8	3.0	3.8	50			26	17	9	24	8	32	7	10	A-2-4	0	568					
		SS-4	6.5	6.8	4.5	4.8	50	30								5	10	A-2-4	0						
12	RB	SS-1	0.0	1.5	-0.9	0.6	25										10	A-4a	8						
	-002-0	SS-2	1.5	3.0	0.6	2.1	25			27	19	8	41	27	68		14	A-4a	7						
	-02	SS-3	3.0	4.5	2.1	3.6	30			31	19	12	37	36	73		14	A-6a	8						
		SS-4	4.5	7.5	3.6	6.6	28	25		24	16	8	39	38	77		11	A-4a	8						
13	RB	SS-1	0.0	1.5	0.7	2.2	10										14	A-6a	10			N_{60}		12"	
	-003-0	SS-2	1.5	2.5	2.2	3.2	13			30	18	12	31	30	61		14	A-6a	6						
	-02	SS-3	2.5	4.5	3.2	5.2	8			36	18	18	45	44	89		16	A-6b	11						
		SS-4	4.5	6.0	5.2	6.7	24	8		36	20	16	44	43	87		16	A-6b							
14	B	SS-1	2.0	2.9	0.0	0.9	50									20	10	A-4a	8			Mc			
	011-0	SS-2	3.5	5.0	1.5	3.0	9		1.5	31	18	13	47	41	88	25	14	A-6a	9	792		HP & Mc			
	25	SS-3	5.0	6.5	3.0	4.5	25		4.5	34	18	16	39	48	87	16	16	A-6b	10	256					
		SS-4	6.5	8.0	4.5	6.0	34	9	4.5							15	16	A-6b	16						
15	LRB	SS-1	1.0	1.9	0.6	1.5	50		2.75								14	A-6a	10						
	-001-0	SS-2	3.5	5.0	3.1	4.6	22		3.25								14	A-6a	10						
	-02	SS-3	6.0	7.5	5.6	7.1	6		3.25	25	17	8	32	30	62		12	A-4a							
		SS-4	8.5	10.0	8.1	9.6	18	6	1.75								10	A-4a							
16	LRB	SS-1	1.0	2.5	0.7	2.2	26		1.75	26	19	7	33	26	59		14	A-4a	5						
	-005-0	SS-2	3.5	5.0	3.2	4.7	43		3.5								10	A-4a	8						
	-02	SS-3	6.5	8.0	6.2	7.7	15		3.5								10	A-4a							
		SS-4	8.5	10.0	8.2	9.7	34	26	4.5								10	A-4a							
17	R	SS-1	1.0	2.5	-0.1	1.4	37		4.5								10	A-4a	8						
	001-0	SS-2	3.5	5.0	2.4	3.9	45		2.5								10	A-4a	8						
	02	SS-3	6.0	7.5	4.9	6.4	19		3	26	19	7	40	36	76		14	A-4a	8						
		SS-4	8.5	10.0	7.4	8.9	22	19	3								10	A-4a							
18	B	SS-1	2.0	2.4	0.0	0.4	50									18	10	A-4a	8			Mc			
	012-0	SS-2A	3.5	4.2	1.5	2.2	18			24	15	9	44	21	65	16	10	A-4a	6			Mc			
	25	SS-2B	4.2	5.0	2.2	3.0	18			27	14	13	20	20	40	13	14	A-6a	2	232					
		SS-3	5.0	6.5	3.0	4.5	16	16		23	16	7	46	19	65	18	11	A-4a	6	184					

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	
19	R	SS-1	1.0	2.5	0.0	1.5	20		4.5								10	A-4a	8						
	002-0	SS-2	3.5	5.0	2.5	4.0	53		3								10	A-4a	8						
	02	SS-3	6.0	7.5	5.0	6.5	15		2								10	A-4a	8						
		SS-4	8.5	10.0	7.5	9.0	16	15	2.5								10	A-4a							
20	R	SS-1	1.0	2.5	0.5	2.0	37		4.5								14	A-6a	10						
	003-0	SS-2	3.5	5.0	3.0	4.5	34		1.5	28	17	11	40	40	80		14	A-6a	8						
	02	SS-3	6.0	7.5	5.5	7.0	32		4.5								14	A-6a							
		SS-4	8.5	10.0	8.0	9.5	60	30									14	A-6a							
21	R	SS-1	1.0	2.5	0.4	1.9	15		4.5	31	19	12	38	37	75		14	A-6a	9						
	004-0	SS-2	3.5	5.0	2.9	4.4	28		4.5								14	A-6a	10						
	02	SS-3	6.0	7.5	5.4	6.9	38		4.5								14	A-6a							
		SS-4	8.5	10.0	7.9	9.4	62	15	4.5								14	A-6a							
22	B	SS-1	2.0	3.5	0.0	1.5	80									18	10	A-4a	8			Mc			
	013-0	SS-2	3.5	5.0	1.5	3.0	13		3	24	14	10	43	28	71	17	10	A-4a	7	264		N_{60} & Mc			
	25	SS-3	5.0	6.5	3.0	4.5	10		2.5	34	19	15	45	46	91	23	14	A-6a	10	784					
		SS-4	6.5	8.0	4.5	6.0	18	10	4.5							19	14	A-6a	10						
23	R	SS-1	1.0	2.5	1.5	3.0	37		4.5								10	A-4a	8						
	005-0	SS-2	3.5	5.0	4.0	5.5	20		4	46	23	23	49	49	98		20	A-7-6	14						
	02	SS-3	6.0	7.5	6.5	8.0	54		4								18	A-7-6							
		SS-4	8.5	10.0	9.0	10.5	42	20	4.5								18	A-7-6							
24	B	SS-1	2.0	3.5	0.0	1.5	33									4	6	A-1-a	0						
	014-0	SS-2	3.5	5.0	1.5	3.0	52			17	11	6	7	5	12	3	6	A-1-a	0	952					
	25	SS-3	5.0	6.5	3.0	4.5	37			21	14	7	7	7	14	5	10	A-2-4	0	904					
		SS-4	6.5	8.0	4.5	6.0	46	30								3	10	A-2-4	0						
25	R	SS-1	1.0	2.5	2.8	4.3	45		4								6	A-1-a	0						
	006-0	SS-2	3.5	5.0	5.3	6.8	14		2.5								10	A-2-6							
	02	SS-3	6.0	7.5	7.8	9.3	8										10	A-2-6							
		SS-4	8.5	10.0	10.3	11.8	6	14									10	A-2-6							
26	R	SS-1	1.0	2.5	0.6	2.1	23		4.5	NP	NP	NP	24	23	47		11	A-4a	2						
	007-0	SS-2	3.5	5.0	3.1	4.6	12		0.75								10	A-4a	8						
	02	SS-3	6.0	7.5	5.6	7.1	38		4.5								10	A-4a							
		SS-4	8.5	10.0	8.1	9.6	42	12	2								10	A-4a							
27	R	SS-1	1.0	2.5	-0.8	0.7	17			32	28	4	23	30	53		23	A-4a	4						
	008-0	SS-2	3.5	5.0	1.7	3.2	11										10	A-2-6	4			N_{60}			
	02	SS-3	6.0	7.5	4.2	5.7	14		3								10	A-2-6	4						
		SS-4	8.5	10.0	6.7	8.2	20	11	4.5								10	A-2-6							

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#	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	
28	B	SS-1	2.0	3.5	0.0	1.5	61									21	8	A-3a	0						
	015-0	SS-2	3.5	5.0	1.5	3.0	10		3.2	42	26	16	27	40	67	19	23	A-7-6	9	1024		N_{60}			
	25	SS-3	5.0	6.5	3.0	4.5	15		2.5	31	17	14	27	17	44	12	14	A-6a	3	1104					
		SS-4	6.5	8.0	4.5	6.0	12	10	2.5							11	14	A-6a	10						
29	R	SS-1	1.0	2.5	-1.6	-0.1	18		4.5	32	28	4	32	33	65		23	A-4a	6						
	009-0	SS-2	3.5	5.0	0.9	2.4	20		4.5								10	A-4a	8						
	02	SS-3	6.0	7.5	3.4	4.9	14		4.5								10	A-4a	8						
		SS-4	8.5	10.0	5.9	7.4	45	14									10	A-4a							
30	R	SS-1	1.0	2.5	-1.1	0.4	19		4	37	22	15	26	63	89		17	A-6a	10						
	010-0	SS-2	3.5	5.0	1.4	2.9	8		2.5								14	A-6a	10			N_{60}			
	02	SS-3	6.0	7.5	3.9	5.4	20		3.5								14	A-6a	10						
		SS-4	8.5	10.0	6.4	7.9	44	8	4.5								14	A-6a							
31	R	SS-1	1.0	2.5	0.3	1.8	16		4.5	23	19	4	33	42	75		14	A-4a	8						
	011-0	SS-2	3.5	5.0	2.8	4.3	11		3.5								14	A-6a	10						
	02	SS-3	6.0	7.5	5.3	6.8	32		4.5								14	A-6a							
		SS-4	8.5	10.0	7.8	9.3	39	11	4.25								14	A-6a							
32	B	SS-1	2.0	2.6	0.0	0.6	50									12	10	A-4a	8						
	016-0	SS-2	3.5	5.0	1.5	3.0	13		4	33	18	15	30	41	71	17	14	A-6a	9	352		N_{60} & Mc			
	25	SS-3	5.0	6.5	3.0	4.5	10		2.5	33	16	17	21	31	52	13	16	A-6b	6	240					
		SS-4	6.5	8.0	4.5	6.0	7	7	1.2							19	16	A-6b	16						
33	R	SS-1	1.0	2.5	1.1	2.6	17		2	30	20	10	28	35	63		15	A-4a	6						
	012-0	SS-2	3.5	5.0	3.6	5.1	17		3.25								10	A-4a	8						
	02	SS-3	6.5	8.0	6.6	8.1	18		2.5								10	A-4a							
		SS-4	8.5	10.0	8.6	10.1	64	17									10	A-4a							
34	R	SS-1	1.0	2.5	0.4	1.9	23		4.5	39	23	16	46	45	91		18	A-6a	10						
	013-0	SS-2	3.5	5.0	2.9	4.4	42		4.5								14	A-6a	10						
	02	SS-3	6.0	7.5	5.4	6.9	30		4.5								14	A-6a							
		SS-4	8.5	10.0	7.9	9.4	49	23	4.5								14	A-6a							
35	B	SS-1	2.0	3.5	0.0	1.5	73									22	10	A-4a	8			Mc			
	017-0	SS-2	3.5	5.0	1.5	3.0	28		4.5	40	21	19	29	62	91	17	16	A-6b	12	232					
	25	SS-3	5.0	6.5	3.0	4.5	30		4.5	39	20	19	25	62	87	18	16	A-6b	12	576					
		SS-4	6.5	8.0	4.5	6.0	22	22	4.5							21	16	A-6b	16						
36	R	SS-1	1.0	2.5	0.3	1.8	24		4.5								10	A-4a	8						
	014-0	SS-2	3.5	5.0	2.8	4.3	16		3.75								10	A-4a	8						
	02	SS-3	6.5	8.0	5.8	7.3	14		1.75	25	18	7	49	32	81		13	A-4a							
		SS-4	8.5	10.0	7.8	9.3	19	14	4								10	A-4a							

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#	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	
37	TRB	SS-1	1.0	2.5	1.4	2.9	26										10	A-4a	8						
	-005-0	SS-2	3.5	5.0	3.9	5.4	17			35	22	13	30	19	49		17	A-4a	4						
	-02	SS-3	6.0	7.5	6.4	7.9	16										10	A-4a							
		SS-4	7.5	8.9	7.9	9.3	50	17									0	Rock							
38	B	SS-1	2.0	2.7	0.0	0.7	50									25	6	A-1-b	0						
	018-0	SS-2	3.5	5.0	1.5	3.0	24						8	2	10	44	6	A-1-b	0	856					
	25	SS-3	5.0	6.5	3.0	4.5	4			28	19	9	28	33	61	13	14	A-4a	5	624					
		SS-4	6.5	8.0	4.5	6.0	10	4	2.5							16	10	A-4a	8						
39	R	SS-1	1.0	2.5	1.0	2.5	28		2.75								10	A-4a	8						
	015-0	SS-2	3.5	5.0	3.5	5.0	23		4.5								10	A-4a	8						
	02	SS-3	6.0	7.5	6.0	7.5	6		4								10	A-4a							
		SS-4	8.5	10.0	8.5	10.0	45	6	4.5								10	A-4a							
40	R	SS-1	1.0	2.5	0.1	1.6	18		4.5	41	23	18	27	60	87		20	A-7-6	11						
	016-0	SS-2	3.5	5.0	2.6	4.1	26		4.5								18	A-7-6	16						
	02	SS-3	6.0	6.8	5.1	5.9	50										18	A-7-6							
		SS-4	8.5	8.7	7.6	7.8	50	18									0	Rock							
41	B	SS-1	2.0	3.5	0.0	1.5	24		3							23		A-7-5	16						Exc. & Replace 26"
	019-0	SS-2A	3.5	4.2	1.5	2.2	50		2	53	37	16	27	24	51	35		A-7-5	6	408	A-7-5		26"		
	25	SS-2B/3	4.2	5.4	2.2	3.4	50									5	0	Rock	0						
		SS-4	6.5	8.0	4.5	6.0	73	24	4.5	35	18	17	42	44	86	11	16	A-6b	11	576					
42	R	SS-1	1.0	2.5	-0.6	0.9	16		4.25	33	18	15	36	35	71		14	A-6a	9						
	017-0	SS-2	3.5	5.0	1.9	3.4	18		2.5								18	A-7-6	16						
	02	SS-3	6.0	7.5	4.4	5.9	6		2.25	44	23	21	47	46	93		20	A-7-6	13						
		SS-4	8.5	10.0	6.9	8.4	25	6	2								18	A-7-6							
43	R	SS-1	1.0	2.5	-0.6	0.9	18		4.5								10	A-4a	8						
	018-0	SS-2	3.5	5.0	1.9	3.4	16		4.5								10	A-4a	8						
	02	SS-3	6.0	7.5	4.4	5.9	19		4.5								10	A-4a	8						
		SS-4	8.5	10.0	6.9	8.4	26	16	3.5								16	A-6b							
44	R	SS-1	1.0	2.5	0.5	2.0	18		4.25								16	A-6b	16						
	019-0	SS-2	3.5	5.0	3.0	4.5	25		3	38	22	16	43	43	86		17	A-6b	10						
	02	SS-3	6.0	7.5	5.5	7.0	22		4.5								18	A-7-6							
		SS-4	8.5	10.0	8.0	9.5	39	18	4.5								18	A-7-6							
45	B	SS-1	2.0	3.5	0.0	1.5	83									12	6	A-1-b	0						
	020-0	SS-2	3.5	5.0	1.5	3.0	18		4.5	32	18	14	41	37	78	14	14	A-6a	10	616					
	25	SS-3	5.0	6.5	3.0	4.5	19		4.5	32	19	13	36	37	73	16	14	A-6a	9	432					
		SS-4	6.5	8.0	4.5	6.0	24	18	4.5							16	14	A-6a	10						

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#	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	
46	R	SS-1	1.0	2.5	0.7	2.2	17		2	28	19	9	30	26	56		14	A-4a	4						
	020-0	SS-2	3.5	5.0	3.2	4.7	14		3.25								10	A-4a	8						
	02	SS-3	6.0	7.5	5.7	7.2	12		4.5								14	A-6a							
		SS-4	8.5	10.0	8.2	9.7	34	12	4.5								14	A-6a							
47	R	SS-1	1.0	2.5	1.8	3.3	16		1.25								10	A-4a	8			HP			
	021-0	SS-2	3.5	5.0	4.3	5.8	30		3.5								10	A-4a	8						
	02	SS-3	6.0	7.1	6.8	7.9	50		0.75								14	A-6a							
		SS-4	8.5	8.7	9.3	9.5	50	16									0	Rock							
48	B	SS-1A	2.0	3.1	0.0	1.1	37									43	8	A-3a	0						
	021-0	SS-1B/2	3.1	5.0	1.1	3.0	12		4	31	15	16	33	33	66	18	16	A-6b	9	168					
	25	SS-3/4A	5.0	6.7	3.0	4.7	22		4.5	31	17	14	9	34	43	17	14	A-6a	3	328					
		SS-4B	6.7	8.0	4.7	6.0	10	10	2.8							26	14	A-6a	10						
49	R	SS-1	1.0	2.5	0.3	1.8	15		1	34	25	9	24	29	53		20	A-4a	4			HP		**12"**	
	022-0	SS-2	3.5	5.0	2.8	4.3	17		2.75								10	A-4a	8						
	02	SS-3	6.0	7.5	5.3	6.8	12		4.5								10	A-4a							
		SS-4	8.5	10.0	7.8	9.3	24	12	4.5								10	A-4a							
50	B	SS-1	2.0	3.5	0.0	1.5	89									17	10	A-4a	8			Mc			
	022-0	SS-2	3.5	5.0	1.5	3.0	22		3.5	29	18	11	23	21	44	13	14	A-6a	2	240					
	25	SS-3	5.0	6.5	3.0	4.5	22		4.5	27	15	12	23	21	44	12	14	A-6a	2	312					
		SS-4	6.5	8.0	4.5	6.0	22	22	4.5							14	14	A-6a	10						
51	R	SS-1	1.0	2.5	-1.6	-0.1	15		2.25								14	A-6a	10						
	023-0	SS-2	3.5	5.0	0.9	2.4	21		2								14	A-6a	10						
	02	SS-3	6.0	7.5	3.4	4.9	21		4	35	21	14	35	34	69		16	A-6a	8						
		SS-4	8.5	10.0	5.9	7.4	43	21									14	A-6a							
52	R	SS-1	1.0	2.5	0.0	1.5	16		3.75								14	A-6a	10						
	024-0	SS-2	3.5	5.0	2.5	4.0	28		0.5								14	A-6a	10						
	02	SS-3	6.0	7.5	5.0	6.5	13		1.75								10	A-4a	8						
		SS-4	8.5	10.0	7.5	9.0	32	13	4.5								10	A-4a							
53	B	SS-1	2.0	2.9	0.0	0.9	50									19	10	A-4a	8			Mc			
	023-0	SS-2	3.5	5.0	1.5	3.0	28		4.5	27	16	11	31	28	59	11	14	A-6a	5	1360					
	25	SS-3	5.0	6.5	3.0	4.5	18		4.5	27	14	13	37	37	74	13	14	A-6a	9	984					
		SS-4	6.5	8.0	4.5	6.0	18	18	4.5							16	14	A-6a	10						
54	R	SS-1	1.0	2.5	-1.4	0.1	15		3.5	29	19	10	32	35	67		14	A-4a	6						
	025-0	SS-2	3.5	5.0	1.1	2.6	16		3.75								10	A-4a	8						
	02	SS-3	6.0	7.5	3.6	5.1	23		2.75								14	A-6a	10						
		SS-4	8.5	10.0	6.1	7.6	36	15	4.5								14	A-6a							

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Subgrade Analysis

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#	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	
55	R	SS-1	1.0	2.5	0.8	2.3	8		4.5								14	A-6a	10			N_{60}		12"	
	026-0	SS-2	3.5	5.0	3.3	4.8	21		3.5	29	18	11	38	38	76		14	A-6a	8						
	02	SS-3	6.0	7.5	5.8	7.3	26		4.5								14	A-6a							
		SS-4	8.5	10.0	8.3	9.8	40	8	4.5								14	A-6a							
56	R	SS-1	1.0	2.5	0.0	1.5	14		2.75								10	A-4a	8						
	027-0	SS-2	3.5	5.0	2.5	4.0	18		4.5								10	A-4a	8						
	02	SS-3	6.0	7.5	5.0	6.5	27		2.5	36	21	15	42	42	84		16	A-6a	10						
		SS-4	8.5	10.0	7.5	9.0	36	14	4.25								14	A-6a							
57	B	SS-1	2.0	2.6	0.0	0.6	50									21	10	A-4a	8			Mc			
	024-0	SS-2	3.5	5.0	1.5	3.0	13		4.5	31	16	15	37	39	76	17	14	A-6a	10	1440		N_{60} & Mc			
	25	SS-3	5.0	6.5	3.0	4.5	9		4.5	27	14	13	28	34	62	15	14	A-6a	7	1232					
		SS-4	6.5	8.0	4.5	6.0	16	9	3							16	14	A-6a	10						
58	R	SS-1	1.0	2.5	2.5	4.0	13		4.5								10	A-4a	8						
	028-0	SS-2	3.5	5.0	5.0	6.5	12		3								10	A-4a	8						
	02	SS-3	6.0	7.5	7.5	9.0	7			NP	NP	NP	12	11	23		6	A-1-b							
		SS-4	8.5	10.0	10.0	11.5	4	12									6	A-1-b							
59	R	SS-1	1.0	2.5	-0.2	1.3	33		4.5								10	A-4a	8						
	029-0	SS-2	3.5	3.8	2.3	2.6	50										0	Rock	0						
	02	SS-3	6.0	6.2	4.8	5.0	50										0	Rock	0						
		SS-4	8.5	8.5	7.3	7.3	50	30																	
60	B	SS-1	2.0	3.5	0.0	1.5	31									5	6	A-1-b	0						
	025-0	SS-2	3.5	4.7	1.5	2.7	50						8	8	16	10	6	A-1-b	0	208					
	25	SS-3	5.0	5.2	3.0	3.2	50									8	0	Rock	0						
								30																	
61	R	SS-1	1.0	2.5	0.1	1.6	22										0	Rock	0		Rock		6"		Exc. & Replace 6"
	030-0	SS-2	3.5	3.8	2.6	2.9	50										0	Rock	0						
	02	SS-3	4.0	4.1	3.1	3.2	50										0	Rock	0						
62	R	SS-1	1.0	2.5	0.1	1.6	16		4.5	44	24	20	47	47	94		21	A-7-6	13						
	031-0	SS-2	3.5	4.8	2.6	3.9	50		4.5								18	A-7-6	16						
	02	SS-3	6.0	6.2	5.1	5.3	50										0	Rock							
		SS-4	8.5	8.6	7.6	7.7	50	16									0	Rock							
63	B	SS-1	2.0	3.5	0.0	1.5	12		2.5							18	16	A-6b	16						
	026-0	SS-2	3.5	5.0	1.5	3.0	15		4.5	33	17	16	32	43	75	15	16	A-6b	10	336					
	25	SS-3	5.0	6.5	3.0	4.5	24		4.5	43	22	21	27	66	93	21	19	A-7-6	13	264					
		SS-4A	6.5	7.3	4.5	5.3	90	12								21	18	A-7-6	16						

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	
64	R	SS-1	1.0	1.3	0.4	0.7	50										0	Rock	0		Rock		6"		Exc. & Replace 6"
	032-0	SS-2	3.5	3.8	2.9	3.2	50										0	Rock	0						
	02	SS-3	6.0	6.2	5.4	5.6	50										0	Rock							
		SS-4	8.5	8.5	7.9	7.9	50	30																	
65	R	SS-1	1.0	2.5	0.5	2.0	39		4.5								14	A-6a	10						
	033-0	SS-2	3.5	5.0	3.0	4.5	15		3.25	37	22	15	44	44	88		17	A-6a	10						
	02	SS-3	6.0	7.5	5.5	7.0	29		4.5								14	A-6a							
		SS-4	8.5	10.0	8.0	9.5	64	15	4.5								14	A-6a							
66	R	SS-1	1.0	2.5	0.5	2.0	16		1.5								10	A-4a	8			HP		12"	
	034-0	SS-2	3.5	5.0	3.0	4.5	12		3.75								14	A-6a	10						
	02	SS-3	6.0	7.5	5.5	7.0	16		3.5								14	A-6a							
		SS-4	8.5	10.0	8.0	9.5	27	12	3.25								14	A-6a							
67	R	SS-1	1.0	2.5	0.0	1.5	14		4.5	50	21	29	41	41	82		18	A-7-6	18						
	035-0	SS-2	3.5	5.0	2.5	4.0	4		0.75								18	A-7-6	16						
	02	SS-3	6.0	7.5	5.0	6.5	13		1.5								18	A-7-6	16						
		SS-4	8.5	10.0	7.5	9.0	11	4	2.5								18	A-7-6							
68	R	SS-1	1.0	2.5	-0.6	0.9	13		2.25								14	A-6a	10						
	036-0	SS-2	3.5	5.0	1.9	3.4	7			32	20	12	40	40	80		15	A-6a	9			N_{60}			
	02	SS-3	6.0	7.5	4.4	5.9	7		2.5								14	A-6a	10						
		SS-4	8.5	10.0	6.9	8.4	7	7	0.5								14	A-6a							
69	B	SS-1	2.0	2.4	0.0	0.4	50									9	10	A-4a	8						
	027-0	SS-2	3.5	5.0	1.5	3.0	12		4.5	23	14	9	33	22	55	10	10	A-4a	4	288					
	25	SS-3	5.0	6.5	3.0	4.5	15		4.5	27	15	12	37	27	64	12	14	A-6a	7	672					
		SS-4	6.5	8.0	4.5	6.0	31	12	4.5							12	14	A-6a	10						
70	R	SS-1	1.0	2.5	4.4	5.9	15		3	34	20	14	32	47	79		15	A-6a	10						
	037-0	SS-2	3.5	5.0	6.9	8.4	28		2.75								14	A-6a							
	02	SS-3	6.0	7.5	9.4	10.9	39		4.5								14	A-6a							
		SS-4	8.5	10.0	11.9	13.4	39	15	3.75								14	A-6a							
71	R	SS-1	1.0	2.5	-1.9	-0.4	20		4.5	26	17	9	32	29	61		12	A-4a	5						
	038-0	SS-2	3.5	5.0	0.6	2.1	51		4.5								10	A-4a	8						
	02	SS-3	6.0	7.5	3.1	4.6	37		4.5								10	A-4a	8						
		SS-4	8.5	10.0	5.6	7.1	44	30	3								10	A-4a							
72	R	SS-1	1.0	2.5	-1.0	0.5	20		3.25								14	A-6a	10						
	040-0	SS-2	3.5	5.0	1.5	3.0	29		4								14	A-6a	10						
	02	SS-3	6.0	7.5	4.0	5.5	26		4	35	21	14	42	42	84		16	A-6a	10						
		SS-4	8.5	10.0	6.5	8.0	33	20	4.5								14	A-6a							

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	
73	B	SS-1A	2.0	3.3	0.0	1.3	59									31	10	A-4a	8			Mc			
	028-0	SS-1B/2	3.3	5.0	1.3	3.0	13		4.5	29	15	14	32	27	59	17	14	A-6a	6	384		N_{60} & Mc			
	25	SS-3	5.0	6.5	3.0	4.5	22		4.5	39	17	22	31	51	82	18	14	A-6a	10	408					
		SS-4	6.5	8.0	4.5	6.0	16	13	4.5							20	16	A-6b	16						
74	R	SS-1	1.0	2.5	-0.7	0.8	19		4.5	28	18	10	34	42	76		13	A-4a	8						
	042-0	SS-2	3.5	5.0	1.8	3.3	16		4.25								10	A-4a	8						
	02	SS-3	6.0	7.5	4.3	5.8	15		4.5								10	A-4a	8						
		SS-4	8.5	10.0	6.8	8.3	19	15	2.5								10	A-4a							
75	RB	SS-2	1.5	3.0	-1.1	0.4	31			27	17	10	33	30	63		12	A-4a	6						
	-006-0	SS-3	3.0	4.5	0.4	1.9	32			29	18	11	31	30	61		14	A-6a	6						
	-02	SS-4	4.5	6.0	1.9	3.4	22			28	17	11	29	28	57		14	A-6a	5						
		SS-5	8.5	10.0	5.9	7.4	13	13		38	19	19	33	32	65		16	A-6b							
76	RB	SS-2	1.5	2.4	-0.6	0.3	50										10	A-4a	8						
	-007-0	SS-3	3.0	4.5	0.9	2.4	38			24	16	8	34	25	59		11	A-4a	5						
	-02	SS-4	4.5	7.0	2.4	4.9	24			25	16	9	30	22	52		14	A-6a	3						
		SS-5	7.0	10.0	4.9	7.9	38	24		27	16	11	33	33	66		14	A-6a	7						
77	RB	SS-2	1.5	3.0	-0.4	1.1	37										10	A-4a	8						
	-008-0	SS-3	3.0	4.5	1.1	2.6	24			25	16	9	38	29	67		11	A-4a	6						
	-02	SS-4	4.5	6.0	2.6	4.1	36			26	18	8	32	26	58		13	A-4a	5						
		SS-5	8.5	10.0	6.6	8.1	26	24		26	16	10	37	32	69		11	A-4a							
78	RB	SS-2	1.5	3.0	-0.5	1.0	16			29	17	12	32	32	64		14	A-6a	7						
	-009-0	SS-3	3.0	4.5	1.0	2.5	16			27	16	11	33	32	65		14	A-6a	6						
	-02	SS-4	4.5	7.2	2.5	5.2	14										14	A-6a	10						
		SS-5	7.2	10.0	5.2	8.0		14		25	19	6	59	28	87		14	A-4b							
79	B	SS-1	2.5	4.0	0.5	2.0	18		4.5							20	16	A-6b	16			Mc			
	029-0	SS-2	4.0	5.5	2.0	3.5	19		4.5	30	14	16	36	30	66	18	16	A-6b	9	424					
	25	SS-3	5.5	7.0	3.5	5.0	22		4.5	25	14	11	38	24	62	10	14	A-6a	6	1408					
		SS-4	7.0	8.5	5.0	6.5	21	18	4.5							19	14	A-6a	10						

PID: PID 122947

County-Route-Section: MAH-76/80-8.50/0.00
No. of Borings: 79

Geotechnical Consultant: S&ME, Inc.
Prepared By: Kevin Harper/Brian K. Sears, PE
Date prepared: 5/21/2025

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	7

% Samples within 3 feet of subgrade			
$N_{60} \leq 5$	1%	HP ≤ 0.5	0%
$N_{60} < 12$	6%	0.5 < HP ≤ 1	1%
$12 \leq N_{60} < 15$	6%	1 < HP ≤ 2	4%
$N_{60} \geq 20$	41%	HP > 2	33%
M+	7%		
Rock	7%		
Unsuitable Soil	200%		

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

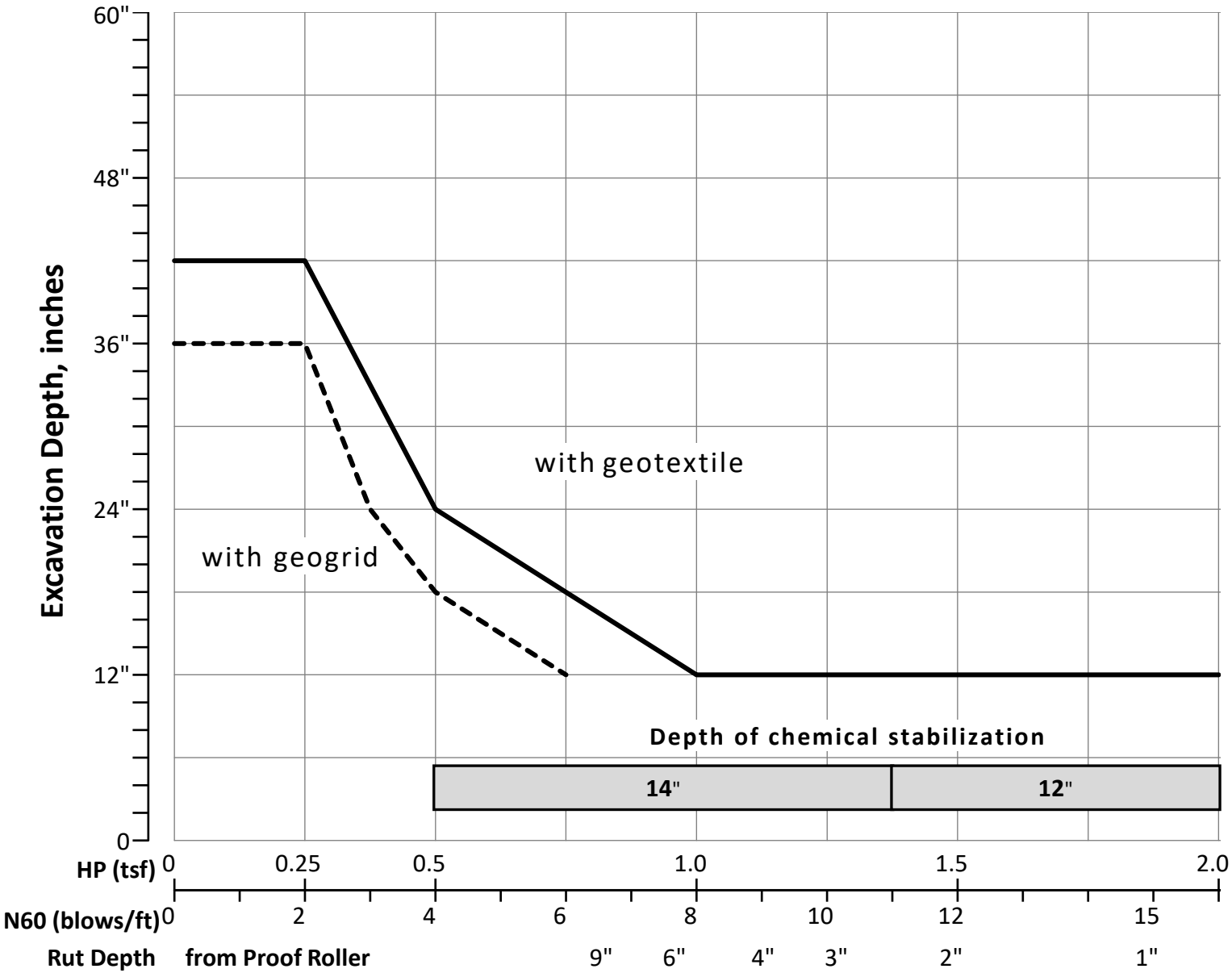
% Proposed Subgrade Surface	
Unstable & Unsuitable	20%
Unstable	18%
Unsuitable (Soil & Rock)	2%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	29	17	3.61	31	18	12	31	30	61	15	12	7
Maximum	90	30	4.50	53	37	29	59	66	98	44	23	18
Minimum	4	4	0.50	17	11	3	2	1	4	3	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	22	7	9	5	0	6	0	1	6	98	1	0	99	22	2	20	0	0	298
Percent	0%	7%	2%	3%	2%	0%	2%	0%	0%	2%	33%	0%	0%	33%	7%	1%	7%	0%	0%	100%
% Rock|Granular|Cohesive	0%	7%	44%									48%								100%
Surface Class Count	0	10	7	7	1	0	1	0	1	6	55	0	0	37	9	2	8	0	0	144
Surface Class Percent	0%	7%	5%	5%	1%	0%	1%	0%	1%	4%	38%	0%	0%	26%	6%	1%	6%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.61		☐ HP
16.76		☐ N60L

Average HP
Average N_{60L}

Appendix E – OGE Geotechnical Design Checklists

I. Geotechnical Design Checklists	
Project: MAH-76/80-8.50/0.00	**PDP Path:**
PID: 122947	**Review Stage: N/A**

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:	MAH-76/80-8.50/0.00	PID:	122947	Reviewer:	KAH/BKS	Date:	5/21/2025

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:	Y	
	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 provided by ODOT and was incorporated into the subgrade analysis. See Appendix B for historic boring information.
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	Spacing for new subgrade borings was directed by ODOT D4 and OGE.
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?	Y	See assigned SGE ID on historic boring logs in Appendix B.

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:	MAH-76/80-8.50/0.00	PID:	122947	Reviewer:	KAH/BKS	Date:	5/21/2025

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	With the exception of where shallow bedrock was encountered. In some cases, inadequate recovery did not allow for full classification to be performed.
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	
d. Has the sulfate content of all samples that exhibit gypsum crystals been determined?	Y	
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-7-5
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?	X	Plans 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?	X	Plans by others.
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	
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?	X	Plans 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)?	X	ODOT will determine the preferred subgrade remediation and construction approach. No recommendations requested for this data report.
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	ODOT will determine the preferred subgrade remediation and construction approach. No recommendations requested for this data report. The majority of the project has already been chemically stabilized.
	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?	X	Plans by others.
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	Plans by others.
8	Has a design CBR value been provided?	N	See subgrade analysis table in Appendix D.

VI.B. Geotechnical Reports

C-R-S:	MAH-76/80-8.50/0.00	PID:	122947	Reviewer:	KAH/BKS	Date:	5/21/2025

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	Recommendations were not requested by ODOT.
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	