SUBGRADE EXPLORATION

Full-Depth Roadway Reconstruction

HEN-109-06.00, PID 95741

SR 18 to Ash Run & Liberty Center Twp Hwy W

Henry County, Ohio

Submitted to Carpenter Marty Transportation

Date ***December 2024***

Prepared by

TTL associates inc
Environmental, Geotechnical Engineering & Testing

Ohio Department of Transportation

Full-Depth Roadway Reconstruction

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Henry County, Ohio

Subgrade Exploration

Carpenter Marty Transportation

Columbus, Ohio

December 11, 2024

TTL Project No. 2223901

TTL Associates, Inc.
1915 North 12th Street
Toledo, OH 43604-5305
419-342-2222
www.ttlassoc.com

1915 North 12th Street
Toledo, OH 43604-5305
T 419-324-2222
F 419-241-1808
www.ttlassoc.com

December 11, 2024 **TTL Project No. 2223901**

Mr. Kevin P. Carpenter, P.E., P.S.
Carpenter Marty Transportation
6612 Singletree Drive
Columbus, Ohio 43229

Final Report
Subgrade Exploration
HEN-109-06.00, PID 95741
Full-Depth Roadway Reconstruction
Henry County, Ohio

Dear Mr. Carpenter:

Following is the report of our Subgrade Exploration performed by TTL Associates, Inc. (TTL) for the referenced project. This study was performed in accordance with TTL Proposal No. 2223901, dated March 29, 2022 and was authorized by Carpenter Marty Transportation via a subconsultant service agreement, dated May, 2022 referencing this project, HEN-109-06.00, PID 95741.

A draft report was provided on February 15, 2023. On December 11, 2024, it was indicated that there were no comments to the draft report and that it could be submitted as final. This report contains the results of our study, our engineering interpretation of the results with respect to the project characteristics, our recommendations for design and construction of pavements as well as potential modifications to subgrade soils. Subgrade evaluations were performed in accordance with ODOT GB-1 "Plan Subgrades."

Should you have any questions regarding this report or require additional information, please contact our office.

Sincerely,

TTL Associates, Inc.

STATE OF OHIO
CURTIS E. ROUPE
Reg # 59857
REGISTERED PROFESSIONAL ENGINEER

Luke G. Holmes, EIT
Geotechnical Professional II

Curtis E. Roupe, P.E.
Vice President

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FINAL REPORT
SUBGRADE EXPLORATION
HEN-109-06.00, PID 95741
FULL-DEPTH ROADWAY RECONSTRUCTION
HENRY COUNTY, OHIO

FOR

CARPENTER MARTY TRANSPORTATION
6612 SINGLETREE DRIVE
COLUMBUS, OHIO 43229

SUBMITTED

DECEMBER 11, 2024
TTL PROJECT NO. 2223901
(CT PROJECT NO. 229255)

TTL ASSOCIATES, INC.
1915 NORTH 12TH STREET
TOLEDO, OHIO 43604
(419) 324-2222
(419) 321-6257 FAX

EXECUTIVE SUMMARY

This subgrade exploration report has been prepared for the full-depth roadway reconstruction of State Route 109 (SR 109) in Henry County, Ohio. The south segment of the project extends approximately 2⅓ miles from SR 18 to Ash Run. The north segment of the project extends approximate 2½ miles from the north Liberty Center Corporation Line to the Fulton County Line (Township Highway W). This exploration included 67 test borings for the evaluation of existing pavement sections and subgrade conditions in areas of proposed roadway construction. Subgrade evaluations were performed in accordance with ODOT GB-1 "Plan Subgrades" (July 16, 2021). A summary of the conclusions and recommendations of this study are as follows:

1. The borings were performed in the existing pavement in the drive lanes. Borings designated with an odd number (B-001, B-003, etc.) were performed along the southbound lane. While, borings designated with an even number (B-002, B-004, etc.) were performed along the northbound lane. The borings encountered surface materials consisting of asphalt underlain by an aggregate base.

2. Existing **fill** soils were encountered along both the southern and northern project segment. The non-soil components of the fill generally consisted of trace asphalt fragments. Along the **southern segment**, fill materials were encountered in Borings B-019 through B-030 to depths generally ranging from 2 to 4 feet below existing grade. However, fill material extended deeper in Borings B-027 and B-028 to a depth of 5½ feet. The fill materials consisted of cohesive soils with SPT-N60 values, unconfined compressive strengths, and moisture contents that were generally consistent with the native soils encountered along the southern segment. However, fill materials consisting predominantly of asphalt fragments were encountered in Boring B-029 to a depth of 2 feet. Along the **northern segment**, fill materials were encountered in Boring B-044 to a depth of 5.8 feet. The fill materials consisted of granular soils with SPT-N60 values and moisture contents that were generally consistent with the native soils encountered along the northern segment. However, fill materials consisting predominantly of asphalt fragments were encountered in Boring B-054 to a depth of 2 feet.

3. Based on the results of our field and laboratory tests, the subsoils encountered underlying the surface materials can generally be characterized as predominantly stiff to hard cohesive soils along the southern segment and loose to medium dense granular soils along the northern segment. The cohesive soils generally consisted of sandy silt (A-4a), silt and clay (A-6a) (*Historic Logs*), silty clay (A-6b), and clay (A-7-6). The granular soils generally consisted of fine sand (A-3) as well as coarse and fine sand (A-3a).

4. Based on the limited data available, such as the soil characteristics and the groundwater conditions encountered in the borings, it is our opinion that the "normal" groundwater level along the southern segment is anticipated to generally be encountered below the depths of this investigation and for the northern segment may be encountered at depths on the order of 5 to 8 feet below existing pavement grades. It should be noted that "perched" water may be encountered in the fill materials that are underlain by relatively impermeable native cohesive soils. Additionally, due to the site's close proximity to several ditches and creeks, ground water levels

are anticipated to mimic or be slightly above those in the river. Albeit with a delay for the southern segment, based on the cohesive native soils. If construction does not occur during a particularly wet period, adequate control of groundwater seepage into excavations extending only a few feet below the "normal" groundwater level should be achievable by minor dewatering systems, such as pumping from prepared sumps. Along the southern segment, even at depths slightly below the "normal" groundwater level, control of groundwater using sumps should be feasible due to the predominantly cohesive nature of the encountered soils and their associated low permeability, but will require due diligence by the contractor to maintain a stable subgrade condition at the bottom of the excavation.

5. For the southern segment, based on the GB-1 "Subgrade Analysis" worksheet, 32 of the 34 borings analyzed contained subgrade soils within the upper profile which indicated subgrade modification is likely to be required. Based on the GB-1 analysis results, subgrade modification may consider global lime stabilization using cement to a depth of 14 inches, or over-excavation and replacement with new granular engineered fill.

6. For the southern segment, based on the GB-1 "Subgrade Analysis" worksheet, the encountered subgrade soils generally consisted of A-3 and A-3a soils, for which ODOT GB-1 prescribes modification should consist of re-working the soils to stabilize the subgrade. However, the subgrade soils in Borings B-045, B-046, and B-047 indicated potential need for modification exceeding re-working granular soils in place. Based on the GB-1 analysis results, subgrade modification may consider global cement stabilization using cement to a depth of 14 inches, or over-excavation and replacement with new granular engineered fill.

7. Along the southern segment, ODOT GB-1 "Subgrade Analysis" worksheet resulted in a CBR value of 5 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally ranged from 10 to 16, which would correlate with a CBR value of 4 to 6 percent. The higher Group Indices of 15 and 16 that correlate to the lower CBR of 4 percent were only observed in a small percentage of the samples that had laboratory testing performed. These higher Group Indices were primarily assumed by the ODOT GB-1 "Subgrade Analysis" worksheet for the A-6b and A-7-6 soil samples that did not receive lab testing. In any case, 32 borings were recommended for undercut and replacement with granular engineered fill. Of the 2 borings that were not indicated treatment, the Group Indices for the laboratory tested samples were 14 or less, corresponding to a CBR value of 5 percent. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 5 percent for the southern project segment.

8. Along the northern segment, ODOT GB-1 "Subgrade Analysis" worksheet resulted in a CBR value of 12 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally varied from 0 to 16, which would correlate with a CBR value of 4 to 12 percent. The lower Group Indices associated with the A-3 and A-3a granular soils that were prominent in the borings

performed and would correlate with a CBR value of 12 percent. The highest Group Indices associated with the A-6b cohesive soils would correlate with a CBR value of 4 percent. However, these were only encountered in 2 borings and within those borings were generally encountered at depths below 3 feet. The middle Group Indices of 4 to 7 associated with the A-4a cohesive soils would correlate with CBR values of 6 to 8 percent. However, the A-4a cohesive soils with Group Indices of 4 to 7 were only encountered in 2 borings that were prescribed undercutting and replacement with granular fill to a depth of 15 and 21 inches. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 12 percent along the northern segment.

This executive summary highlights our evaluations and recommendations and should only be utilized in conjunction with the accompanying report, including the detailed findings, analysis and recommendations, and qualifications presented herein.

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1.0 INTRODUCTION

This subgrade exploration report has been prepared for the full-depth roadway reconstruction of State Route 109 (SR 109) along two stretches of road in Henry County, Ohio. The south segment of the project extends approximately 2⅓ miles from SR 18 to Ash Run as shown on the Site Location Map (Plate 1.1). The north segment of the project extends approximate 2½ miles from the north Liberty Center Corporation Line to the Fulton County Line (Township Highway W) as shown on the Site Location Map (Plate 1.2).

This study was performed in accordance with TTL Proposal No. 2223901, dated March 29, 2022 and was authorized by Carpenter Marty Transportation via a subconsultant service agreement, dated May, 2022 referencing this project, HEN-109-06.00, PID 95741.

1.1 Purpose and Scope of Exploration

The purpose of this exploration was to evaluate the subsurface conditions and laboratory data relative to the design and construction of pavements and low-mast foundation design soil parameters for the referenced project. To accomplish this, TTL performed 67 test borings, laboratory soil testing, a geotechnical engineering evaluation of the test results, and review of available geologic and soils data for the project area.

This report summarizes our understanding of the proposed construction, describes the investigative and testing procedures utilized to evaluate the subsurface conditions at the site, and presents our findings from the field and laboratory testing. This report also presents our evaluations and conclusions in accordance with ODOT GB-1 “Plan Subgrades” (July 16, 2021) and provides our design and construction recommendations for pavements.

This report includes:

- A description of the existing surface materials, subsurface soils, and groundwater conditions encountered in the borings.
- Design recommendations for pavements.
- Recommendations concerning soil and groundwater-related construction procedures such as subgrade preparation in accordance with ODOT GB-1 criteria, earthwork, pavement construction, and related field testing.

Appendix B includes pertinent ODOT Geotechnical Engineering Design Checklists that apply to the scope of this report. This exploration did not include an environmental assessment of the surface or subsurface materials at the site.

1.2 Proposed Construction

The project comprises of the full-depth roadway reconstruction of State Route 109 (SR 109). The south segment of the project extends approximately 2⅓ miles from SR 18 to Ash Run. The north segment of the project extends approximate 2½ miles from the north Liberty Center Corporation Line to the Fulton County Line (Township Highway W).

We have assumed that final roadway grades will approximate existing roadway grades and consist of asphalt pavements. Existing pavement cross-sections encountered in the borings performed for this exploration were on the order of 12 to 24 inches in thickness. For subgrade evaluations, we have assumed that the new pavement cross-section will be on the order of 16 inches in thickness (1.4 feet, average thickness of existing pavement), and that final pavement grades will approximate existing pavement grades.

2.0 GEOLOGY AND OBSERVATIONS OF THE PROJECT

2.1 General Geology and Hydrogeology

Published geologic maps from the Ohio Department of Natural Resources (ODNR) indicate that the project sites are located in the Huron-Erie Lake Plains Section. Within this section the southern segment is located in the Maumee Lake Plains Region and the northern segment is located in the Maumee Sand Plains Region. Within the Maumee Lake Plains, the upper profile geology includes predominantly Pleistocene-age lacustrine silt, clay, and wave-planed clayey till. Within the Maumee Sand Plains, the upper profile geology includes predominantly late Wisconsinan-age sands over clay till and lacustrine deposits. Additionally, both region's geology includes Silurian- and Devonian-age carbonite rock and shale

The lacustrine soils consist of predominantly sands and sandy silts, and may exhibit alternating thin layers of interbedded silts and clays known as varves. Varved soils are characteristic of lacustrine deposits, and the thin layering is typically attributed to seasonal or other cyclic variations of sedimentation in the lake waters.

The glacial till, also referred to as moraine, was deposited by the advance and retreat of glacial ice. Due to the weight of the ice mass, the till deposits are moderately to highly over-consolidated, that is, the existing soil deposits have experienced a previous vertical stress significantly higher than the present effective vertical stress due to the remaining overlying soil strata in the profile. The till may contain cobbles and/or boulders in the till soil matrix. Additionally, seams of granular soils may be encountered within glacial tills. These granular seams may or may not be water bearing.

On the "Geologic Map of Ohio," the project sites are mapped as bedrock consisting of Devonian -age Columbus and Delaware limestone and shale along the southern segment as well as Olentangy and Ohio shale along the northern segment. Bedrock along the southern segment of the site is mapped at Elev. 640± near the north end (B-032) and Elev. 655± near the south end (B-001), corresponding to depths of approximately 45 to 50 feet below existing grades. Bedrock along the northern segment of the site is mapped at Elev. 600± near the south end (B-033) and Elev. 620± near the north end (B-067), corresponding to depths of approximately 70 to 75 feet below existing grades.

The USDA Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that soils in the project area of the southern segment are predominantly mapped as various clay or silty clay loams. With Hoytville silty clay loam (HcA) soils mapped generally south of County Road H (CR H) and Hoytville clay loam (HoA) soils mapped generally north of CR H. The mapped soils along the southern segment of the project are summarized in Table 2.1.A below.

Table 2.1.A NRCS Web Soil Survey Summary - South Segment

Identification	Comprised Of	Formation	Drainage	Permeability
Hoytville Silty Clay Loam (HcA)	Clayey Lodgment Till	Nearshore Zones (Relict), Wave-Worked Till Plains	Very Poorly Drained	Very Low
Hoytville Clay Loam (HoA)		Wave-Worked Till Plains		
Nappanee Silty Clay Loam (NtA)	Wave-Planed Basal Till	Lake Plains, as well as Flats, Knolls, and Rises on Lake Plains	Somewhat Poorly Drained	Low to Moderately Low

The NRCS Web Soil Survey indicates that soils in the project area of the northern segment are predominantly mapped as various fine sand and loamy sand soils. However, several small zones were mapped as Adrian Muck (Ad) and Warners Muck (Wc) just north of County Road V (CR V) extending south approximately 2,700 feet south. These organic soil zones were generally mapped adjacent to SR 109 and not along it. The exception to this was a zone of Wc mapped in the area of a ditch/creak approximately 1,500 feet south of CR V. The mapped soils along the northern segment of the project are summarized in Table 2.1.B below.

Table 2.1.B NRCS Web Soil Survey Summary - North Segment				
Identification	**Comprised Of**	**Formation**	**Drainage**	**Permeability**
Adrian Muck (Ad)	Herbaceous Organic Material Over Sandy Lacustrine Deposits Derived from Limestone, Sandstone, and Shale	Depressions	Very Poorly Drained	Moderately Low to Very High
Arkport Fine Sand (ArB & ArC)	Glaciofluvial Deposits	Ridges on Lake Plains, Dunes	Well Drained	High
Cut and Fill Land (Cu)	*Refers to unban land where surface subsoils have fill materials at the surface as part of a previous development.*			
Galen Fine Sand (GaA & GaB)	Glaciofluvial Deposits	Dunes and Deltas	Moderately Well Drained	High
Galen Loamy Fine Sand (GaB & GbB)	Aeolian Deposits and/or Lacustrine Deposits	Knolls and Ridges on Beach Ridges, Dunes, and Moraines	Moderately Well Drained	Moderately High to High
Granby Loamy Fine Sand (Gr)	Lacustrine Deposits and Lacustrine Deposits Over Outwash	Flats on Lake Plains	Very Poorly Drained	High to Very High
Mermill Loam (Mg)	Lacustrine Deposits Over Basal Till			Low to Moderately High
Oakville Fine Sand (OaB)	Sandy Aeolian Deposits	Beach Ridges and Dunes on Moraines, Lake Plains, and Outwash Plains	Well Drained	High to Very High
Rimer Loamy Fine Sand (RmA)	Lacustrine Deposits Over Basal Till	Lake Plains	Somewhat Poorly Drained	Moderately Low to Moderately High
Tedrow Loamy Fine Sand (TdA)	Lacustrine Deposits Over Aeolian Deposits	Rises on Lake Plains		High
Warners Muck (Wc)	Organic Material	Swamps	Very Poorly Drained	Moderately Low to Moderately High

2.2 Site Reconnaissance

TTL performed a site reconnaissance on June 20 as well as July 5 and 11, 2022. The portion of State Route 109 (SR 109) that was part of this investigation runs through predominantly agricultural and rural residential areas.

Along the southern segment, the pavement was generally in poor condition with a severely weathered surface. Frequent longitudinal and transverse pavement cracking was observed. Multiple locations had portions of the pavement repaired/replaced along the edges. In areas that were not repaired, the pavement edge was often observed to contain alligator cracking. In general, the cracking was not sealed with the main exception being the boundary between the older pavement and the newer replaced sections along the edges.

Pavements in the immediate area of West Creek were in good condition with no visible distresses or weathering indicating that the pavement was recently repaired/replaced.

Along the northern segment, in the vicinity of the Liberty Center city limit and around the locations of Borings B-038, B-042, B-045, B-055, B-065, the pavement was generally in fair condition with moderate weathering and minimal distresses. Individual lanes around the locations of Borings B-034, B-036, B-043, B-044, B-046, B-047 through B-051, B-054, and B-67 were generally in fair condition with moderate weathering and minimal distresses. The pavement in these areas appeared to have been previously repaired/replaced.

Along the remainder of the northern segment, the pavement was generally in poor condition with a severely weathered surface. Frequent longitudinal and transverse pavement cracking was observed. The pavement edge was often observed to contain alligator cracking. Of the observed cracks, approximately half were sealed.

Drainage of the surrounding soils of both project segments appeared to be adequate. Areas of standing water or saturated soils were not observed

Grades along the southern segment generally sloped slightly downward from south to north. Ranging from Elevation of 690± feet to 700± feet. Grades along the northern segment generally sloped slightly upward from south to north. Ranging from Elevation of 677± feet to 688± feet.

Review of the Ohio Department of Natural Resources (ODNR) Map of Mines indicates no mines on record were within the project sites. The closest mapped mine to the southern segment was approximately 1.9 miles south off of the southern end of the segment. The closest mapped mine to the northern segment was approximately 1.5 miles northeast off of the northern end of the segment.

3.0 EXPLORATION

3.1 Historic Borings

3.1.1 South Segment

Review of ODOT Transportation Information Mapping System (TIMS) for the project area indicated three historic projects had been performed along or near State Route 109 (SR 109) near the limits of this current exploration. These projects, included HEN-109-6.55 (1994) (*also referred to as HEN-109-10.539, metric*), HEN/WOO-281-9.91 (1940), and HEN-109-8.36/18.64/21.83 (1962). The project cardfiles, soil profile maps, field logs, summary of tests on soil profile samples, as well as plan-and-profile drawings for these historic projects are included in Appendix C of this report.

Project HEN/WOO-281-9.91 included two borings along SR 281, near SR 109 (between Borings B-027-0-22 and B-028-0-22), on either side of the intersection of these two roads. The soils in these borings was described as 'berm material' to a depth of 0.2 to 0.3 feet, underlain by silty clay (A-6b) to boring termination at depths of 5½ feet and 6 feet below grade. The ODOT A-6b soils are generally consistent with the type of soils encountered during the current investigation. However, differ from the ODOT A-7-6 soils encountered to depths of at least 5½ feet below grade in Borings B-027-0-22 and B-028-0-22 (nearest borings). ODOT A-6b soils were encountered below the A-7-6 soils in these soils. Elevations between the historic borings and the borings performed for this exploration were comparable.

Project HEN-109-8.36/18.64/20.83, specifically HEN-109-8.36, included two borings along SR 109 on either side of Ash Run, just north of Boring B-032-0-22. The soils in these borings were described ODOT A-6a, A-6b, and A-7-6 soils. In the boring south of Ash Run the soils consisted of A-7-6 soils to a depth of 9 feet, underlain by A-6b soils to a depth of 15 feet, further underlain by A-6a soil to a termination depth of 20 feet. In the boring north of Ash Run the soils consisted of A-7-6 soils to a depth of 4 feet, underlain by A-6a soil to a termination depth of 20 feet. These soils are generally consistent with the type of soils encountered during the current investigation and consistent to the soils encountered in Boring B-032-0-22 (nearest boring). However, the silt and clay soils (A-6a) that were encountered in the historic borings starting at depths of 4 and 9 feet were not encountered in the borings performed for the current investigation. The borings performed for the current investigation were only performed to 9 feet below grades and may not have been performed deep enough to encounter the A-6a soils.

It should be noted that Standard Penetration Test (SPT) blow counts or N-values were not provided for any of the historic borings near the current project limits from the historic HEN/WOO-281-9.91 and HEN-109-8.36 projects. As such, the boring data from these two projects were not used in the GB-1 evaluations and design recommendations.

Project HEN-109-6.55 included two borings along SR 109 on either side of West Creek, between Borings B-008-0-22 and B-009-0-22.

The historic borings were not numerated following current ODOT naming practices. For designation within this report, the borings were numerated as B-CCC-D-EE as follows:

- B = Boring.
- CCC = Boring number (001 for Location No 1 etc.).
- D = Number of times offset from original boring location (0 since none were offset).
- EE = Date which the borings were performed (94 for 1994).

The locations of the historic borings located within and just beyond the extents of the project area are summarized in the following table:

Table 3.1 Historic Boring Information

Boring Number	Alignment and Station (feet)	Approximate Offset (feet)	Ground Surface Elevation (feet)	Boring Termination Depth (feet)
B-001-0-94	HEN-109 Historic, 99+63	6’ LT	699.8	41.5
B-002-0-94	HEN-109 Historic, 100+25	8’ RT	699.6	50.6

The soils in these borings were described ODOT A-4a, A-4b, A-6a, A-6b and A-7-6 soils. The upper 6 feet was described as “sandy clay” and classified as silt and clay (A-6a) and clay (A-7-6). The silt soil (ODOT A-4a) was encountered in Boring B-002-0-94 approximately 27 feet below the top of pavement. Therefore, this material is not anticipated to be within the upper 3 feet of the currently planned subgrade. These soils are generally consistent with the type of soils encountered during the current investigation and consistent with the soils encountered in Borings B-008-0-22 and B-009-0-22 (nearest borings). However, as previously stated, the silt and clay soils (A-6a) that were encountered in the historic borings were not encountered in the borings performed for the current investigation. In addition to the historic project information included in Appendix C of this report, the locations of these historic borings are area shown on the Test Boring Location Plan (Plate 2.0) have been included. Furthermore, Standard Penetration Test (SPT) blow counts or N-values were available for this historic project. As

such these two borings have been included in the GB-1 evaluations and design recommendations for the southern segment of the current project. However, the N-values did not appear to be corrected for energy ration nor was a hammer energy ration provided. The energy ration for the hammer was assumed to be 60% when using the N-values for evaluations.

We have assumed that the information provided in the historic borings was accurate and correct, at the time of those respective explorations, but cannot guarantee as such. Additionally, subgrade soil conditions may have changed or may have been modified due to construction performed following completion of the historic subsurface explorations.

3.1.2 North Segment

Review of ODOT Transportation Information Mapping System (TIMS) indicated that no historic test borings have been drilled within the north segment project area. The nearest borings were located south of Liberty Center approximately 1 mile south of this projects area's southernmost limit. As such, historical borings records for the northern segment were not reviewed.

3.2 Project Exploration Program

This exploration included 67 test borings which were extended through the existing State Route 109 (SR 109) pavements. Test borings designated as Borings B-001-0-22 through B-032-0-22 were performed along the southern project segment starting at the intersection of SR 18 extending north approximately 2⅓ miles to Ash Run. Test borings designated as Borings B-033-0-22 through B-067-0-22 were performed along the northern project segment starting at the northern boundary of Liberty Center extending north approximately 2½ miles to the intersection with Township Highway W. Borings designated with an odd number (B-001, B-003, etc.) were performed along the southbound lane. While, borings designated with an even number (B-002, B-004, etc.) were performed along the northbound lane. The borings were performed by TTL during the period from July 13 through 26. These cores and borings are fully designated as in accordance with ODOT protocol, however the "-0-22" portion of the nomenclature is generally omitted for ease of identification in the discussions within this report. The borings were located in the field by TTL spaced approximately 400 feet apart. The approximate locations of the borings are shown on the Test Boring Location Plans (Plates 2.1 through 2.4).

Stationing and offsets at the boring locations were not available at the time of this report submittal. Latitude, Longitude, and ground surface elevations were surveyed by TTL via a handheld GPS. The accuracy from the handheld GPS device was generally found to be approximately 2 to 20 inches horizontal, and approximately 4 to 40 inches vertical. These data are presented on the logs of test borings as well as in Tables 3.2.A and 3.2.B below.

Table 3.2.A General Boring Location Information – Southern Segment						
Boring Number	**Location**	**Alignment and Station (feet)**	**Offset (feet)**	**Ground Surface Elevation (feet)**	**Latitude (Degrees)**	**Longitude (Degrees)**
B-001-0-22	SB Lane	TBD	TBD	699.9	41.254106	-84.036508
B-002-0-22	NB Lane	TBD	TBD	699.2	41.255177	-84.036499
B-003-0-22	SB Lane	TBD	TBD	698.9	41.256282	-84.036564
B-004-0-22	NB Lane	TBD	TBD	699.5	41.257356	-84.036529
B-005-0-22	SB Lane	TBD	TBD	698.9	41.258427	-84.036598
B-006-0-22	NB Lane	TBD	TBD	699.2	41.259529	-84.036566
B-007-0-22	SB Lane	TBD	TBD	698.9	41.260630	-84.036630
B-008-0-22	NB Lane	TBD	TBD	697.4	41.261702	-84.036596
B-009-0-22	SB Lane	TBD	TBD	696.8	41.262808	-84.036664
B-010-0-22	NB Lane	TBD	TBD	697.7	41.263917	-84.036647
B-011-0-22	SB Lane	TBD	TBD	697.1	41.265000	-84.036702
B-012-0-22	NB Lane	TBD	TBD	696.4	41.266116	-84.036680
B-013-0-22	SB Lane	TBD	TBD	696.1	41.267215	-84.036734
B-014-0-22	NB Lane	TBD	TBD	696.0	41.268294	-84.036717
B-015-0-22	SB Lane	TBD	TBD	696.0	41.269388	-84.036767
B-016-0-22	NB Lane	TBD	TBD	695.1	41.270465	-84.036741
B-017-0-22	SB Lane	TBD	TBD	694.7	41.271554	-84.036809
B-018-0-22	NB Lane	TBD	TBD	694.4	41.272641	-84.036765
B-019-0-22	SB Lane	TBD	TBD	694.8	41.273746	-84.036829
B-020-0-22	NB Lane	TBD	TBD	694.1	41.274881	-84.036778
B-021-0-22	SB Lane	TBD	TBD	694.3	41.275956	-84.036870
B-022-0-22	NB Lane	TBD	TBD	693.4	41.277045	-84.036822
B-023-0-22	SB Lane	TBD	TBD	693.9	41.278138	-84.036900
B-024-0-22	NB Lane	TBD	TBD	693.5	41.279230	-84.036861
B-026-0-22	NB Lane	TBD	TBD	692.8	41.280317	-84.036952
B-027-0-22	SB Lane	TBD	TBD	692.9	41.281432	-84.036928
B-028-0-22	NB Lane	TBD	TBD	692.9	41.282511	-84.036988
B-029-0-22	SB Lane	TBD	TBD	692.2	41.283626	-84.036964
B-030-0-22	NB Lane	TBD	TBD	691.5	41.284698	-84.037023
B-031-0-22	SB Lane	TBD	TBD	691.5	41.285822	-84.037006
B-032-0-22	NB Lane	TBD	TBD	690.4	41.286895	-84.037074

NB = Northbound / SB = Southbound
TBD = To be determined

Table 3.2.B General Boring Location Information – Northern Segment						
Boring Number	**Location**	**Alignment and Station (feet)**	**Offset (feet)**	**Ground Surface Elevation (feet)**	**Latitude (Degrees)**	**Longitude (Degrees)**
B-033-0-22	SB Lane	TBD	TBD	679.3	41.450534	-84.008817
B-034-0-22	NB Lane	TBD	TBD	679.1	41.451578	-84.008760
B-035-0-22	SB Lane	TBD	TBD	681.4	41.452683	-84.008802
B-036-0-22	NB Lane	TBD	TBD	680.6	41.453769	-84.008746
B-037-0-22	SB Lane	TBD	TBD	678.6	41.454846	-84.008814
B-038-0-22	NB Lane	TBD	TBD	679.4	41.455932	-84.008749
B-039-0-22	SB Lane	TBD	TBD	679.8	41.457024	-84.008803
B-040-0-22	NB Lane	TBD	TBD	680.5	41.458139	-84.008750
B-041-0-22	SB Lane	TBD	TBD	681.8	41.459253	-84.008803
B-042-0-22	NB Lane	TBD	TBD	680.6	41.460344	-84.008742
B-043-0-22	SB Lane	TBD	TBD	679.8	41.461421	-84.008796
B-044-0-22	NB Lane	TBD	TBD	680.6	41.462537	-84.008731
B-045-0-22	SB Lane	TBD	TBD	680.3	41.463641	-84.008792
B-046-0-22	NB Lane	TBD	TBD	680.3	41.464741	-84.008729
B-047-0-22	SB Lane	TBD	TBD	680.4	41.465797	-84.008782
B-048-0-22	NB Lane	TBD	TBD	681.6	41.466920	-84.008712
B-049-0-22	SB Lane	TBD	TBD	681.1	41.467915	-84.008785
B-050-0-22	NB Lane	TBD	TBD	682.4	41.468940	-84.008722
B-051-0-22	SB Lane	TBD	TBD	682.8	41.470035	-84.008782
B-052-0-22	NB Lane	TBD	TBD	682.4	41.471103	-84.008695
B-053-0-22	SB Lane	TBD	TBD	682.0	41.472051	-84.008776
B-054-0-22	NB Lane	TBD	TBD	682.8	41.473141	-84.008702
B-055-0-22	SB Lane	TBD	TBD	683.6	41.474217	-84.008769
B-056-0-22	NB Lane	TBD	TBD	684.4	41.475215	-84.008712
B-057-0-22	NB Lane	TBD	TBD	682.2	41.476270	-84.008761
B-058-0-22	SB Lane	TBD	TBD	683.0	41.477373	-84.008686
B-059-0-22	NB Lane	TBD	TBD	680.6	41.478448	-84.008768
B-060-0-22	SB Lane	TBD	TBD	681.1	41.479557	-84.008709
B-061-0-22	NB Lane	TBD	TBD	681.6	41.480500	-84.008775
B-062-0-22	SB Lane	TBD	TBD	684.5	41.481531	-84.008704
B-063-0-22	NB Lane	TBD	TBD	682.7	41.482608	-84.008774
B-064-0-22	SB Lane	TBD	TBD	688.1	41.483725	-84.008710
B-065-0-22	NB Lane	TBD	TBD	683.3	41.484801	-84.008751
B-066-0-22	SB Lane	TBD	TBD	686.3	41.485645	-84.008693
B-067-0-22	NB Lane	TBD	TBD	685.1	41.486487	-84.008767

NB = Northbound / SB = Southbound
TBD = To be determined

In accordance with the ODOT Specifications for Geotechnical Explorations (SGE), the upper portion of the borings were performed as ODOT Type A borings to a depth of at least 6 feet below top of subgrade.

Experience indicates that the actual subsoil conditions at a site could vary from those generalized on the basis of test borings made at specific locations, especially at previously developed sites such as this site. Therefore, it is essential that a geotechnical engineer be retained to provide soil engineering services during the site preparation and pavement construction phases of the proposed project. This is to observe compliance with the design concepts, specifications, and recommendations, and to allow design changes in the event subsurface conditions differ from those anticipated prior to the start of construction.

3.3 Boring Methods

The borings were performed with a CME 550x ATV-mounted drill rig as well as a Diedrich D70 track-mounted drill rig, each utilizing 3¼-inch hollow-stem augers. After extending the augers though the pavement materials, samples were generally obtained continuously using 18-inch split-spoon (SS) sample drives to boring termination. All borings were terminated at the planned depth at least 6 feet below existing subgrade. The samples were sealed in jars and transported to our laboratory for further classification and testing.

Split-spoon soil samples were obtained by the Standard Penetration Test Method (ASTM D 1586). The Standard Penetration Test (SPT) consists of driving a 2-inch outside diameter split-spoon sampler into the soil with a 140-pound weight falling freely through a distance of 30 inches. The sampler was driven in three successive 6-inch increments, with the number of blows per increment being recorded. The number of blows per increment was recorded at each depth interval, and these data are presented under the "SPT" column on the Logs of Test Borings attached to this report. The sum of the number of blows required to advance the sampler the second and third 6-inch increments is termed the Standard Penetration Resistance, or N_m-value, and is typically reported in blows per foot (bpf). The N_m-values were corrected to an equivalent rod energy ratio of 60 percent, N_{60}. The hammer/rod energy ratio for the ATV-mounted CME 550x drill rig was 78.1 percent, and was last calibrated on March 15, 2021. The hammer/rod energy ratio for the track-mounted Diedrich D70 drill rig was 90.0 percent, and was last calibrated on April 13, 2022. This energy ratio is limited to an upper bound of 90 percent for the purposes of analyses and reporting in accordance with the ODOT Specification for Geotechnical Explorations (SGE). The N_{60}-values are presented on the attached Logs of Test Borings.

Soil conditions encountered in the test borings are presented in the Logs of Test Borings, along with information related to sample data, SPT results, water conditions observed in the borings, and laboratory test data. In conjunction with published data and typical correlations, the N_{60}-values can be evaluated as a measure of soil compactness/consistency as well as shear strength.

Field and laboratory data were incorporated into gINT™ software for presentation purposes. It should be noted that these logs have been prepared on the basis of laboratory classification and testing as well as field logs of the encountered soils.

3.4 Laboratory Testing Program

All samples were visually classified in accordance with the ODOT Soil Classification System. All recovered samples of the subsoils were also tested in our laboratory for moisture content (ASTM D 2216). Unconfined compressive strength estimates were obtained for the intact cohesive samples using a calibrated hand penetrometer. Unconfined compressive strength estimates were determined from the intact cohesive samples calibrated hand penetrometer. These test results are presented on the Logs of Test Borings and Summary of Soil Test Data sheets.

Laboratory testing was performed in accordance with GB-1 “Plan Subgrades” criteria, including mechanical soil classification consisting of an Atterberg limits test (ASTM D 4318) and a particle size analysis (ASTM D 6913 and D 7928) for at least two samples from each boring within 6 feet of the proposed subgrade. These test results are presented on the Logs of Test Borings, Grain Size Distribution sheets, and Summary of Soil Test Data.

Sulfate content determinations (ODOT Supplement 1122) were performed on one sample from each boring, generally within 3 feet of the proposed subgrade. These test results are presented on the Logs of Test Borings and Summary of Soil Test Data.

4.0 FINDINGS

4.1 General Site Conditions

The borings were performed in the existing pavement in the drive lanes. Borings designated with an odd number (B-001, B-003, etc.) were performed along the southbound lane. While, borings designated with an even number (B-002, B-004, etc.) were performed along the northbound lane. The borings encountered surface materials consisting of asphalt with a thickness on the order of 7 to 10 inches, underlain by an aggregate base a thickness generally ranging from 5 to 11 inches. A summary of the encountered pavement sections is summarized in the following table.

Table 4.1.A Summary of Encountered Pavement Section – Southern Segment			
Boring Number	**Location**	**Asphalt Thickness (inches)**	**Aggregate Base Thickness (inches)**
B-001	SB Lane	9	5
B-002	NB Lane	10	6
B-003	SB Lane	10	7
B-004	NB Lane	10	6
B-005	SB Lane	10	6
B-006	NB Lane	10	6
B-007	SB Lane	9	7
B-008	NB Lane	9	7
B-009	SB Lane	8½	9½
B-010	NB Lane	10	6
B-011	SB Lane	10	6
B-012	NB Lane	10	6
B-013	SB Lane	9½	8½
B-014	NB Lane	10	8
B-015	SB Lane	10	6
B-016	NB Lane	9	9
B-017	SB Lane	10	6
B-018	NB Lane	9	7
B-019	SB Lane	8½	7
B-020	NB Lane	10	5
B-021	SB Lane	10	4
B-022	NB Lane	9	7
B-023	SB Lane	9	7
B-024	NB Lane	9	6
B-025	NB Lane	9	7
B-026	SB Lane	9½	6½
B-027	NB Lane	10	5
B-028	SB Lane	8	7
B-029	NB Lane	8	7
B-030	SB Lane	8	7
B-031	NB Lane	8	9
B-032	SB Lane	10	5

NB = Northbound / SB = Southbound

Table 4.1.B Summary of Encountered Pavement Section – Northern Segment			
Boring Number	**Location**	**Asphalt Thickness (inches)**	**Aggregate Base Thickness (inches)**
B-033	SB Lane	9	9
B-034	NB Lane	9	15
B-035	SB Lane	9	9
B-036	NB Lane	7	9
B-037	SB Lane	7	11
B-038	NB Lane	7	11
B-039	SB Lane	9	5
B-040	NB Lane	9	5
B-041	SB Lane	9	6
B-042	NB Lane	9	5
B-043	SB Lane	7	13
B-044	NB Lane	7	14
B-045	SB Lane	7	14
B-046	NB Lane	7	5
B-047	SB Lane	8	10
B-048	NB Lane	7	11
B-049	SB Lane	8	10
B-050	NB Lane	10	8
B-051	SB Lane	8	9
B-052	NB Lane	9	9
B-053	SB Lane	9	8
B-054	NB Lane	8	9
B-055	SB Lane	8	10
B-056	NB Lane	9	9
B-057	NB Lane	7½	10½
B-058	SB Lane	8	6
B-059	NB Lane	8	10
B-060	SB Lane	8½	9½
B-061	NB Lane	8	10
B-062	SB Lane	9	9
B-063	NB Lane	9	6
B-064	SB Lane	7½	13½
B-065	SB Lane	7½	10½
B-066	NB Lane	8½	12½
B-067	SB Lane	8	9

NB = Northbound / SB = Southbound

Existing fill soils were encountered along both the southern and northern project segment. The non-soil components of the fill generally consisted of trace asphalt fragments. Along the southern segment, fill materials were encountered in Borings B-019 through B-030 to depths generally ranging from 2 to 4 feet below existing grade. However, fill material extended deeper in Borings B-027 and B-028 to a depth of 5½ feet. The fill materials consisted of cohesive soils with SPT-N_{60} values, unconfined compressive strengths, and moisture contents that were generally consistent with the native soils encountered along the southern segment, described in the next section. However, fill materials consisting predominantly of asphalt fragments were encountered in Boring B-029 to a depth of 2 feet.

Along the northern segment, fill materials were encountered in Boring B-044 to a depth of 5.8 feet. The fill materials consisted of granular soils with SPT-N_{60} values and moisture contents that were generally consistent with the native soils encountered along the northern segment, described in the next section. However, fill materials consisting predominantly of asphalt fragments were encountered in Boring B-054 to a depth of 2 feet.

4.2 General Soil Conditions

Based on the results of our field and laboratory tests, the subsoils encountered underlying the surface materials can generally be characterized as predominantly stiff to hard cohesive soils along the southern segment and loose to medium dense granular soils along the northern segment. It should be noted that cohesive soil consistency is based almost exclusively on the hand penetrometer results per the instruction of ODOT District 2.

The **south segment** consisted of predominantly stiff, very stiff, and hard consistency cohesive soils. Unconfined compressive strengths generally ranged from 2,000 pounds per square foot (psf) to greater than 9,000 psf (maximum reading obtainable using a hand penetrometer). However, several zones within the southern segment soils had unconfined compressive strengths as low as 1,000 psf, indicative of a medium stiff consistency. SPT N_{60}-values generally ranged from 9 to 21 blows per foot (bpf). However, SPT N_{60}-values ranging from 4 to 8 bpf were also prominent throughout the cohesive soils, indicative of a soft to medium stiff consistency. Moisture contents generally varied from 11 to 31 percent.

The **north segment** consisted predominantly of **loose** to medium dense compactness granular soils. SPT N_{60}-values generally varied from 4 to 29 blows per foot (bpf). Moisture contents varied from 4 to 29 percent, generally increasing with depth.

Additional descriptions of the stratigraphy encountered in the borings are presented on the Logs of Test Borings.

4.3 Groundwater Conditions

In the southern segment, groundwater was initially encountered during drilling operations only in Boring B-015 at depths of 8 feet. Groundwater was observed upon completion of drilling in the same boring at the same depth. Groundwater was observed neither during drilling nor upon completion of drilling operations in any of the remaining south segment borings.

In the northern segment, groundwater was initially encountered during drilling operations in Borings B-035 through B-060 and B-063 at depths ranging from 4.7 to 8 feet. Groundwater was observed upon completion of drilling in the same borings at depths ranging from 5.2 to 8 feet.

It should be noted that each of the borings was drilled and backfilled within the same day. As such, stabilized water levels may not have occurred over this limited time period. Instrumentation was not installed to observe long-term groundwater levels.

Based on the limited data available, such as the soil characteristics and the groundwater conditions encountered in the borings, it is our opinion that the “normal” groundwater level along the southern segment is anticipated to generally be encountered below the depths of this investigation and for the northern segment may be encountered at depths on the order of 5 to 8 feet below existing pavement grades. This exploration did not include research of possible hydrological influences at the project site. It should be noted that groundwater elevations can fluctuate with seasonal and climatic influences. In particular, “perched” water may be encountered in the fill materials that are underlain by relatively impermeable native cohesive soils. Additionally, due to the site’s close proximity to several ditches and creeks, ground water levels are anticipated to mimic or be slightly above those in the river. Albeit with a delay for the southern segment, based on the cohesive native soils. Therefore, the groundwater conditions at the site may vary at different times of the year from those encountered during this investigation.

4.4 Remedial Measures

4.4.1 South Segment

Based on the GB-1 "Subgrade Analysis" worksheet (V14.6, 02/11/2022), 32 of the 34 borings analyzed contained subgrade soils within the upper profile which indicated subgrade modification is likely to be required. Based on the GB-1 analysis results, subgrade modification may consider global lime stabilization using cement to a depth of 14 inches, or over-excavation and replacement with new granular engineered fill. This new pavement project includes approximately 2⅓ miles of paving, over the 1-mile threshold that is often when global chemical stabilization becomes cost effective. Therefore, we anticipate global chemical stabilization will be the more economical subgrade stabilization method for this project.

4.4.2 North Segment

Based on the GB-1 "Subgrade Analysis" worksheet (V14.6, 02/11/2022), the encountered subgrade soils generally consisted of A-3 and A-3a soils, for which ODOT GB-1 prescribes modification should consist of re-working the soils to stabilize the subgrade. However, the subgrade soils in Borings B-045, B-046, and B-047 indicated potential need for modification exceeding re-working granular soils in place. Based on the GB-1 analysis results, subgrade modification may consider global cement stabilization using cement to a depth of 14 inches, or over-excavation and replacement with new granular engineered fill. This new pavement project includes approximately 2½ miles of paving, of which less than a quarter mile indicated potential need for modification exceeding re-working granular soils in place. Therefore, we anticipate over-excavation and replacement with new granular engineered fill and re-working of the existing granular soils will be the more economical subgrade stabilization method for this project. However, it should be anticipated that most of the granular subgrade soils will require scarification and aeration, along with in-place densification, as part of the subgrade preparation.

The scope of this study did not include an environmental assessment of the surface or subsurface materials at this site.

5.0 ANALYSES AND RECOMMENDATIONS

The following analysis and recommendations are based on our understanding of the proposed construction and on the data obtained during our field exploration. If the project alignment or subgrade depth should change significantly, a review of these recommendations should be made by TTL.

5.1 GB-1 "Plan Subgrades" Evaluation

An evaluation of the subgrade soils was completed in general accordance with ODOT Geotechnical Bulletin GB-1 "Plan Subgrades" (July 16, 2021). As part of this evaluation, the ODOT "Subgrade Analysis" worksheet (V14.6, 02/11/2022) was completed for the project and is attached to this report.

Existing pavement cross-sections encountered in the borings performed for this exploration were on the order of 12 to 24 inches in thickness. For subgrade evaluations, we have assumed that the new pavement cross-section will be on the order of 16 inches in thickness (1.4 feet, average thickness of existing pavement), and that final pavement grades will approximate existing pavement grades.

Based on GB-1, soils classified as ODOT A-4b, A-2-5, A-5, A-7-5, A-8a, A-8b, or rock have been designated as being problematic with respect to pavement subgrade support. ODOT A-7-5 soil was encountered in Boring B-001 (south segment) to a depth of 0.6 feet below the planned subgrade elevation. None of these soil types were encountered at planned or within 3 feet of the planned subgrade elevations in the remaining borings performed for this exploration.

The subgrade materials encountered in the borings located along the southern project segment included predominantly cohesive soils consisting of ODOT A-4a, A-6b, and A-7-6 soils. A zone of uncontrolled fill (UCF) consisting of asphalt fragments was also encountered in Boring B-029 to a depth of 0.6 feet below the planned subgrade elevation.

The subgrade materials encountered in the borings located along the northern project segment included predominantly granular soils consisting of ODOT A-3 and A-3a. Cohesive soils consisting of ODOT A-4a and A-6b were encountered in Borings B-042, and B-045 through B-047. In Borings B-045 through B-047, these soils were encountered within 3 feet of the planned subgrade elevation to depth ranging from 0.6 to 5.2 feet below planned subgrade elevation. Additionally, a zone of uncontrolled fill (UCF) consisting of asphalt fragments was also encountered in Boring B-054 to a depth of 0.6 feet below the planned subgrade elevation.

Based on GB-1 criteria, subgrade soils with moisture contents greater than 3 percent above optimum likely indicate the presence of unstable subgrade that may require some form of subgrade modification.

Along the southern segment, moisture contents for approximately 40 percent of the tested subgrade soil samples were greater than 3 percent above the optimum as determined using GB-1 criteria. It should be noted that approximately 75 percent of the evaluated samples with moisture contents greater than 3 percent above optimum had moisture contents equal to or greater than 5 percent above optimum. Thus, where moisture contents were wet of optimum, they were significantly wet of optimum. Scarification and aeration methods may not be feasible to achieve satisfactory proof rolling and stabilization of the cohesive subgrades.

Along the northern segment, moisture contents for approximately 80 percent of the tested subgrade soil samples were greater than 3 percent above the optimum as determined using GB-1 criteria. It should be noted that approximately 95 percent of the evaluated samples with moisture contents greater than 3 percent above optimum had moisture contents equal to or greater than 5 percent above optimum. Thus, where moisture contents were wet of optimum, they were significantly wet of optimum. Scarification and aeration methods are generally feasible to achieve satisfactory proof rolling and stabilization of the granular subgrades provided the project schedule permits it.

The type and thickness of subgrade modification is determined by GB-1 criteria based on the average, low SPT N_{60}-value (N_{60L}) of the subgrade soils in a particular portion of the project area, hand penetrometer values, soil type, and moisture content. Along the southern segment, based on these criteria, 32 of the 34 borings evaluated contained subgrade soils within the upper profile which indicated subgrade modification is likely to be required. Along the northern segment, only 3 of the 35 boring performed contained subgrade soils within the upper profile which indicated subgrade modification above reworking the soils in place is likely to be required. Based on the GB-1 analysis results, subgrade modification may consider global chemical stabilization using lime for the southern segment and cement for the northern segment, or over-excavation and replacement with new granular engineered fill. The GB-1 prescribed type and depth of global chemical stabilization for each segment is summarized in the following table.

Table 5.1.A GB-1 Recommended Type and Depth of Global Chemical Stabilization		
Location	**Chemical Type**	**Stabilization Depth (Inches)**
South Segment (*2⅓ miles - SR 18 to Ash Run*)	Lime	14
North Segment (*2½ miles – Liberty Center to Twp Hwy W*)	Cement	14

As required by GB-1, sulfate content tests (ODOT Supplement 1122) were performed on a sample within the upper 3 feet of anticipated subgrade elevation from each boring. The sulfate content test results are summarized in the following table.

Table 5.1.B Sulfate Content							
South Segment (Note1) (*2⅓ miles - SR 18 to Ash Run*)				**North Segment (*2½ miles – Liberty Center to Twp Hwy W*)**			
Boring Number	**Sulfate Content (ppm)**	**Boring Number**	**Sulfate Content (ppm)**	**Boring Number**	**Sulfate Content (ppm)**	**Boring Number**	**Sulfate Content (ppm)**
B-001	310	B-019	260	B-033	<100	B-051	<100
B-002	300	B-020	260	B-034	<100	B-052	<100
B-003	310	B-021	260	B-035	<100	B-053	110
B-004	300	B-022	270	B-036	<100	B-054	110
B-005	300	B-023	290	B-037	<100	B-055	<100
B-006	310	B-024	290	B-038	<100	B-056	<100
B-007	310	B-025	300	B-039	<100	B-057	<100
B-008	300	B-026	280	B-040	140	B-058	110
B-009	300	B-027	280	B-041	130	B-059	<100
B-010	300	B-028	290	B-042	130	B-060	<100
B-011	300	B-029	290	B-043	<100	B-061	<100
B-012	310	B-030	300	B-044	<100	B-062	100
B-013	310	B-031	310	B-045	<100	B-063	120
B-014	300	B-032	300	B-046	<100	B-064	120
B-015	250			B-047	120	B-065	<100
B-016	260			B-048	<100	B-066	130
B-017	260			B-049	<100	B-067	140
B-018	<100			B-050	150		

Note (1) - Sulfate testing data was not available for the historic borings.

GB-1 indicates that chemical stabilization cannot be utilized when sulfate contents for the majority of the samples exceed 3,000 parts per million (ppm), or individual soil samples exhibit sulfate contents of greater than 5,000 ppm. All tested samples had a sulfate content on the order of 310 ppm or less. Based on GB-1 criteria, sulfate content would not be restrictive to considering global chemical stabilization.

Stabilization may also be performed using excavate and replace methods. A summary of the depths of undercut indicated by GB-1 analyses is presented in the following table.

Table 5.1.C GB-1 Recommended Depth of Undercut and Replacement with Granular Engineered Fill (South Segment, 2⅓ miles - SR 18 to Ash Run)			
Boring Number	**GB-1 Recommended Depth of Undercut and Replacement with Granular Engineered Fill (inches)**	**Recommended Subgrade Modification Extents**	**Approximate Project Segment Length (feet)**
B-001-0-22 & B-002-0-22	15	Sta. TBD to Sta. TBD	624
B-003-0-22 & B-004-0-22	12	Sta. TBD to Sta. TBD	790
B-005-0-22	8	Sta. TBD to Sta. TBD	397
B-006-0-22 Through B-018-0-22 & B-001-0-94	12	Sta. TBD to Sta. TBD	1,090
B-002-0-94	No treatment indicated by GB-1	Sta. TBD to Sta. TBD	170
B-009-0-22 Through B-018-0-22		Sta. TBD to Sta. TBD	3,931
B-019-0-22	15	Sta. TBD to Sta. TBD	409
B-020-0-22 & B-021-0-22	12	Sta. TBD to Sta. TBD	799
B-022-0-22	No treatment indicated by GB-1	Sta. TBD to Sta. TBD	398
B-023-0-22 Through B-026-0-22	12	Sta. TBD to Sta. TBD	1,600
B-027-0-22	8	Sta. TBD to Sta. TBD	401
B-028-0-22	14	Sta. TBD to Sta. TBD	399
B-029-0-22 Through B-032-0-22	12	Sta. TBD to Sta. TBD	1,536

TBD = to be determined

Table 5.1.D GB-1 Recommended Depth of Undercut and Replacement with Granular Engineered Fill (North Segment, 2½ miles – Liberty Center to Twp Hwy W)			
Boring Number	**GB-1 Recommended Depth of Undercut and Replacement with Granular Engineered Fill (inches)**	**Recommended Subgrade Modification Extents**	**Approximate Project Segment Length (feet)**
B-033-0-22 Through B-044-0-22	Rework in Place	Sta. TBD to Sta. TBD	4,641
B-045-0-22	15	Sta. TBD to Sta. TBD	402
B-046-0-22	8	Sta. TBD to Sta. TBD	394
B-047-0-22	21	Sta. TBD to Sta. TBD	398
B-048-0-22 Through B-067-0-22	Rework in Place	Sta. TBD to Sta. TBD	7,401

TBD = to be determined

It should be noted that, in the above tables, transitions were based on the station approximately half way between borings indicating areas of recommended treatment and borings indicating no treatment or varying undercut depth was required by GB-1 analyses.

Where undercut and replacement is utilized, all fill should consist of ODOT Item 304 Aggregate Base or Item 703.16C, Granular Material Type B or Type C. It is recommended that geotextile fabric (referenced in ODOT Item 204, and specified as ODOT Item 712.09, Type D) be utilized on the subgrade at the bottom of the undercut zone. If particularly unstable subgrades are encountered during construction, or undercuts exceed approximately 18 inches, a geogrid could be used to reduce the total undercut and replacement of the unsuitable soils by 6 inches.

It should be noted that GB-1 analyses are used as a pre-construction tool to plan subgrade modification alternatives. **Actual subgrade modification will depend on field observations of proof-rolling conditions at the time of construction.** Changes in soil moisture content could create more or less favorable subgrade conditions that may result in adjustments to subgrade modification or soil stabilization requirements at the time of construction.

5.2 Flexible (Asphalt) Pavement Design

Based on the GB-1 analysis, a design CBR of 6 percent was determined for the project. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples of the project. Additionally, based on the length of the project and the GB-1 recommended depth of undercut and replacement with granular

engineered fill, consideration should be given to lime stabilization along the southern project segment. ODOT generally requests a modified design CBR for the chemically stabilized soils. Based on Section 203.4.1 of the Pavement Design Manual (PDM), the subgrade resilient modulus (proportional to the CBR) may be increased by 36 percent when using global chemical stabilization. The design CBR values determined by the GB-1 analysis performed and a modified design CBR per the increase described in the PDM for each project segment are summarized in the following table.

Table 5.2 GB-1 CBR Results by Intersection		
Stabilization	**Design CBR (Percent)**	
	South Segment (***2⅓ miles - SR 18 to Ash Run***)	**North Segment** (***2½ miles – Liberty Center to Twp Hwy W***)
Undercut and replacement with granular engineered fill per Tables 5.1.C/D *(GB-1 Calculated)*	5	12
Global chemical stabilization to a depth of 14 inches per Table 5.1.A *(PDM Modified)*	7	16

Along the southern segment, ODOT GB-1 "Subgrade Analysis" worksheet resulted in a CBR value of 5 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally ranged from 10 to 16, which would correlate with a CBR value of 4 to 6 percent. The higher Group Indices of 15 and 16 that correlate to the lower CBR of 4 percent were only observed in a small percentage of the samples that had laboratory testing performed. These higher Group Indices were primarily assumed by the ODOT GB-1 "Subgrade Analysis" worksheet for the A-6b and A-7-6 soil samples that did not receive lab testing. In any case, 32 borings were recommended for undercut and replacement with granular engineered fill. Of the 2 borings that were not indicated treatment, the Group Indices for the laboratory tested samples were 14 or less, corresponding to a CBR value of 5 percent. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 5 percent for the southern project segment.

Along the northern segment, ODOT GB-1 "Subgrade Analysis" worksheet resulted in a CBR value of 12 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally varied from 0 to 16, which would

correlate with a CBR value of 4 to 12 percent. The lower Group Indices associated with the A-3 and A-3a granular soils that were prominent in the borings performed and would correlate with a CBR value of 12 percent. The highest Group Indices associated with the A-6b cohesive soils would correlate with a CBR value of 4 percent. However, these were only encountered in 2 borings and within those borings were generally encountered at depths below 3 feet. The middle Group Indices of 4 to 7 associated with the A-4a cohesive soils would correlate with CBR values of 6 to 8 percent. However, the A-4a cohesive soils with Group Indices of 4 to 7 were only encountered in 2 borings that were prescribed undercutting and replacement with granular fill to a depth of 15 and 21 inches. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 12 percent along the northern segment.

It should also be noted that the design CBR values are based on subgrades compacted to at least 100 percent of the maximum dry density as determined by ASTM D 698 (Standard Proctor) or verified as stable through proof-rolling in accordance with Section 5.3 of this report.

All pavement design and paving operations should conform to ODOT specifications. The pavement and subgrade preparation procedures outlined in this report should result in a reasonably workable and satisfactory pavement. It should be recognized, however, that all pavements need repairs or overlays over time as a result of progressive yielding under repeated loading for a prolonged period.

It is recommended that proof rolling, placement of aggregate base, and placement of asphalt be performed within as short a time period as possible. Exposure of the aggregate base to rain, snow, or freezing conditions may lead to deterioration of the subgrade and/or base materials due to excessive moisture conditions and to difficulties in achieving the required compaction.

5.3 Site and Subgrade Preparation

Site and subgrade preparation activities should conform to ODOT Construction and Materials Specifications (CMS) Item 204 specifications. Site preparation activities should include the removal of vegetation, topsoil, root mats, pavements, and other deleterious non-soil materials from all proposed roadway areas. The actual amount of required stripping should be determined in the field by a geotechnical engineer or qualified representative.

Upon completion of the clearing and undercutting activities, all areas that are to receive fill, or that have been excavated to proposed final subgrade elevation, should be inspected by a geotechnical engineer. Pavement subgrades should be proof rolled in accordance with ODOT CMS 204.06.

Any unsuitable materials observed during the inspection and proof-rolling operations should be undercut and replaced with compacted fill, or stabilized in place utilizing conventional remedial measures such as discing, aeration, and recompaction. As stated previously, based on the conditions encountered during our exploration, where subgrade soil moisture contents were wet of optimum, they were significantly wet of optimum. The encountered granular subgrade soils should be generally conducive for subgrade modification consisting of scarification, aeration, and in-place re-compaction, provided weather conditions and construction schedule will allow for these activities. However, scarification and aeration methods may not be feasible to achieve satisfactory proof rolling and stabilization of the cohesive subgrades encountered along the southern segment of the project.

The GB-1 analysis indicates options for "planned" subgrade modification consisting of global chemical stabilization using lime (south segment) or cement (north segment) to a depth of 14 inches, or over-excavation of unsuitable subgrade soils and replacement with new granular engineered fill.

Along the southern segment, the GB-1 analysis recommended over-excavation and replacement for 32 of the 34 borings evaluated. Therefore, we anticipate global chemical stabilization using lime to a depth of 14 inches will be the more economical subgrade stabilization method for this project segment.

Along the northern segment, the GB-1 analysis recommended over-excavation and replacement for only 3 of the 35 borings performed with recommendation to reworking the granular soils in place for the remaining borings. Therefore, we anticipate over-excavation and replacement will be the more economical subgrade stabilization method for this project segment.

5.4 Groundwater Control

Encountered groundwater conditions were previously discussed in Section 4.3. Based on the limited data available, such as the soil characteristics and the groundwater conditions encountered in the borings, it is our opinion that the "normal" groundwater level along the

southern segment is anticipated to generally be encountered below the depths of this investigation and for the northern segment may be encountered at depths on the order of 5 to 8 feet below existing pavement grades. It should be noted that "perched" water may be encountered in the fill materials that are underlain by relatively impermeable native cohesive soils. Additionally, due to the site's close proximity to several ditches and creeks, ground water levels are anticipated to mimic or be slightly above those in the river. Albeit with a delay for the southern segment, based on the cohesive native soils.

If construction does not occur during a particularly wet period, adequate control of groundwater seepage into excavations extending only a few feet below the "normal" groundwater level should be achievable by minor dewatering systems, such as pumping from prepared sumps. Along the southern segment, even at depths slightly below the "normal" groundwater level, control of groundwater using sumps should be feasible due to the predominantly cohesive nature of the encountered soils and their associated low permeability, but will require due diligence by the contractor to maintain a stable subgrade condition at the bottom of the excavation.

5.5 Excavations and Slopes

The sides of temporary excavations for construction should be adequately sloped to provide stable sides and safe working conditions. Otherwise, the excavation must be properly braced against lateral movements. In any case, applicable Occupational Safety and Health Administration (OSHA) safety standards must be followed.

Based on the test borings, the soils likely to be encountered in shallow excavations may include:

- OSHA Type A soils (cohesive soils with unconfined compressive strengths of 3,000 pounds per square foot (psf) or greater),
- OSHA Type B soils (cohesive soils with unconfined compressive strengths greater than 1,000 psf but less than or equal to 3,000 psf), and
- OSHA Type C soils (existing fill materials and cohesive soils with unconfined compressive strengths less than 1,000 psf).

Temporary excavations in Type A, B, and C soils should be constructed no steeper than ¾ horizontal to 1 vertical (¾H:1V), 1H:1V, and 1½H:1V, respectively. For situations where a higher strength soil overlies a lower strength soil, and the excavation extends into the lower

strength soil, the slope of the entire excavation is governed by that required for the lower strength soil. In all cases, flatter slopes may be required if lower strength soils or adverse seepage conditions are encountered during construction.

For permanent excavations and slopes, we recommend that grades generally be no steeper than 3H:1V. It should be noted that ODOT routinely uses 2H:1V slopes for roadway embankments. While these steeper slopes may be used, it is our experience that the embankment faces on these slopes are more prone to erosion and sloughing.

5.6 Fill

Material for engineered fill or backfill required to achieve design grades should meet ODOT Item 203 "Embankment Fill" placement and compaction requirements. In general, suitable fills may consist of any non-organic soils having a maximum dry density as determined by the Standard Proctor (ASTM D 698) of 90 pounds per cubic foot (pcf) or greater. Additionally, fill utilized to achieve design grades should consist of materials similar to, or better than, the on-site soils. Otherwise, a reduced CBR value may be required for pavement design.

On-site soils may be used as engineered fill materials provided that they are free of organic matter, debris, excessive moisture, and rock or stone fragments larger than 3 inches in diameter. Depending on seasonal conditions, the on-site soils may be wet of optimum and may require scarification and aeration to achieve satisfactory compaction. However, if the construction schedule does not allow for scarification and aeration activities, it may be more practical or economical to utilize imported granular fill.

Fill should be placed in uniform layers not more than 8 inches thick (loose measure) and adequately keyed into stripped and scarified soils. All fill placed within pavement areas should be compacted to a dry density consistent with the requirements of ODOT Item 203, based on the maximum dry density as determined by ASTM D 698.

The on-site soils consist of predominantly cohesive soils. For the cohesive soils, a sheepsfoot roller should provide the most effective soil compaction. For granular fill, or dense-graded aggregate pavement base materials, a vibratory smooth-drum roller would be required to provide effective compaction.

Scarified subgrade soils and all fill material should be within 3 percent of the optimum moisture content to facilitate compaction. Furthermore, fill material should not be frozen or placed on a frozen base. It is recommended that all earthwork and site preparation activities be conducted under adequate specifications and properly monitored in the field by a qualified geotechnical testing firm.

6.0 QUALIFICATION OF RECOMMENDATIONS

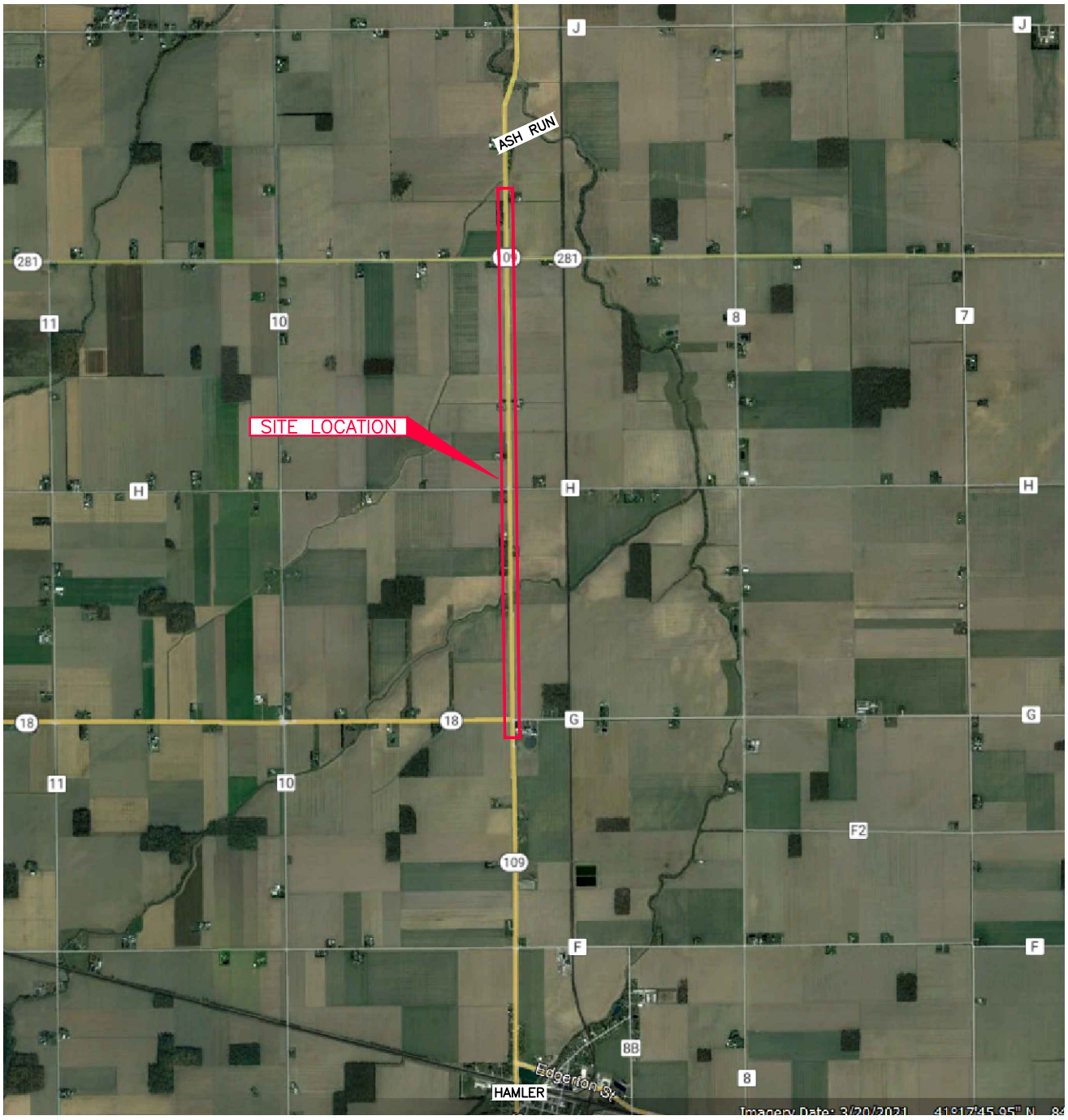
Our evaluation of the pavement design and construction conditions has been based on the data obtained during our field exploration, as well as the criteria in ODOT Geotechnical Bulletin GB-1 "Plan Subgrades" (July 16, 2021). The general subsurface conditions were based on interpretation of the subsurface data at specific boring locations. Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions at the time of construction are not as anticipated by the designers, or that the construction process has altered the soil conditions. This is especially true for previously developed sites. Therefore, experienced geotechnical engineers should observe earthwork and pavement construction to confirm that the conditions anticipated in design are noted. Otherwise, TTL assumes no responsibility for construction compliance with the design concepts, specifications, or recommendations.

The design recommendations in this report have been developed on the basis of the previously described project characteristics and subsurface conditions. If project criteria or locations change, TTL should be permitted to determine whether the recommendations must be modified. The findings of such a review will be presented in a supplemental report.

The nature and extent of variations between the borings may not become evident until the course of construction. If such variations are encountered, it will be necessary to reevaluate the recommendations of this report after on-site observations of the conditions.

Our professional services have been performed, our findings derived, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied. TTL is not responsible for the conclusions, opinions, or recommendations of others based on this data.

PLATES



LEGEND

APPROXIMATE SITE LOCATION

N

APPROXIMATE SCALE – FEET

0 3,600 7,200

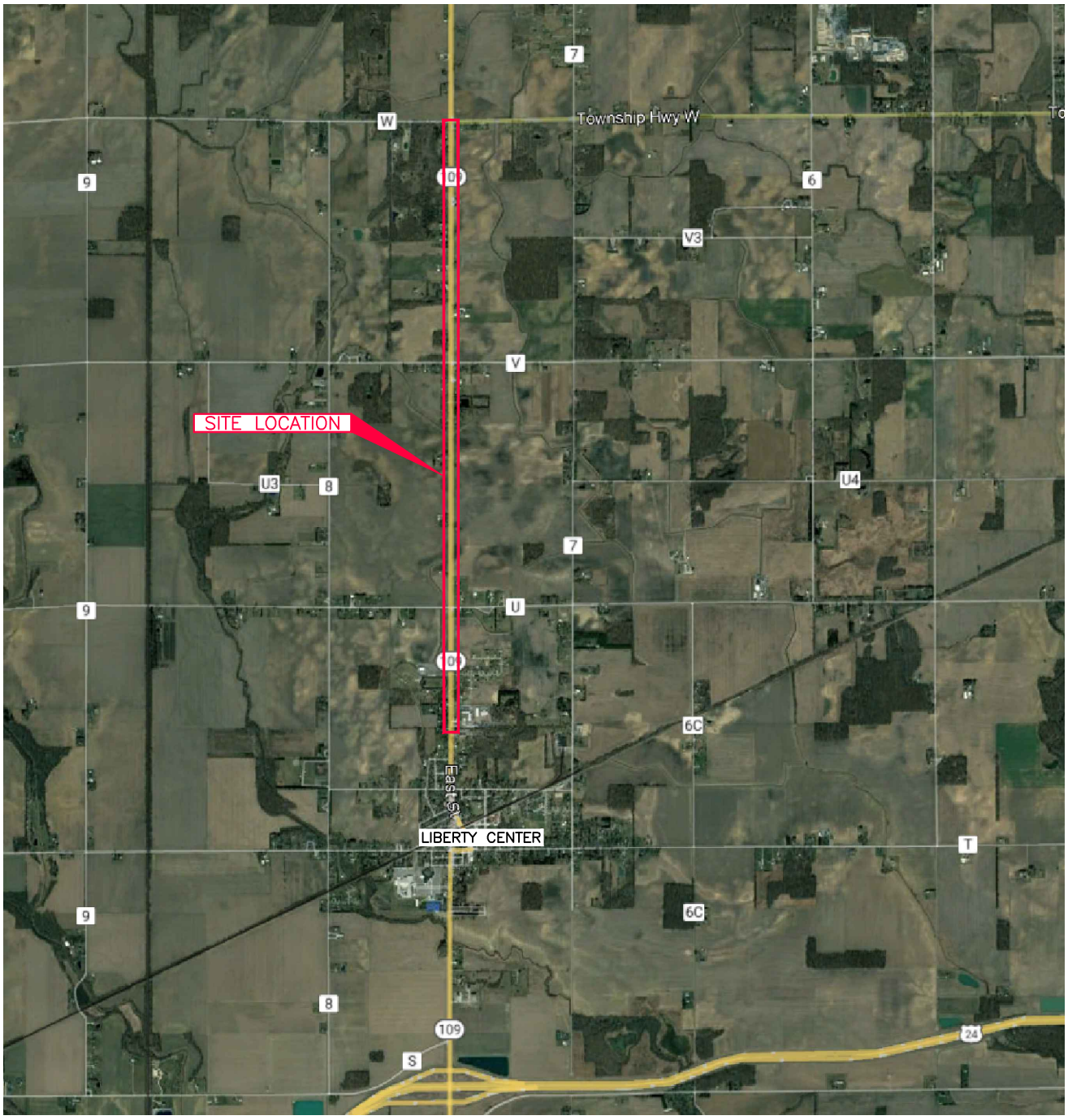
PLATE 1.1
SITE LOCATION MAP

HEN–109–06.00, PID 95741
S SEGMENT – APPROX. 2–1/3 MILES: SR 18 TO ASH RUN
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN TRR/12–2–22	CHECKED LGH/12–7–22
REVISED	APPROVED
JOB NO. 2223901	
DRAWING NUMBER **2223901–01.1G**	

TTL associates inc
Environmental, Geotechnical Engineering & Testing



LEGEND

APPROXIMATE SITE LOCATION

N

APPROXIMATE SCALE – FEET

0 3,400 6,800

PLATE 1.2
SITE LOCATION MAP

HEN–109–06.00, PID 95741
N SEGMENT – APPROX. 2-1/2 MILES: LIBERTY CENTER TO TWP HIGHWAY W
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN TRR/12–2–22	CHECKED LGH/12–7–22
REVISED	APPROVED
JOB NO. 2223901	
DRAWING NUMBER **2223901–01.2G**	

TTL associates inc
Environmental, Geotechnical Engineering & Testing

LEGEND

B-001-0-22 — APPROXIMATE TEST BORING LOCATION

B-001-0-94 — APPROXIMATE HISTORIC TEST BORING LOCATION, HEN-109-6.55 (1994)

A — — — A' MATCHLINE

APPROXIMATE SCALE – FEET

0 200 400

BASE AERIAL IMAGE OBTAINED FROM A GOOGLE EARTH IMAGE DATED MARCH 20, 2021.

PLATE 2.1
TEST BORING LOCATION PLAN

HEN-109-06.00, PID 95741
S SEGMENT-APPROX. 2-1/3 MILES: SR 18 TO ASH RUN
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN	TRR/12-2-22	CHECKED	LGH/12-7-22
REVISED	TRR/2-8-23	APPROVED	
JOB NO.	2223901		
DRAWING NUMBER	**2223901-02.1G**		

ATL associates inc
Environmental, Geotechnical Engineering & Testing

LEGEND

B–017–0–22 APPROXIMATE TEST BORING LOCATION

B——————B' MATCHLINE

APPROXIMATE SCALE – FEET

0 200 400

BASE AERIAL IMAGE OBTAINED FROM A GOOGLE EARTH IMAGE DATED MARCH 20, 2021.

PLATE 2.2
TEST BORING LOCATION PLAN

HEN–109–06.00, PID 95741
S SEGMENT–APPROX. 2–1/3 MILES: SR 18 TO ASH RUN
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN TRR/12–2–22	CHECKED LGH/12–7–22
REVISED	APPROVED
JOB NO. 2223901	
DRAWING NUMBER **2223901–02.2G**	

ATL associates inc
Environmental, Geotechnical Engineering & Testing

LEGEND

B-033-0-22 ⊕ APPROXIMATE TEST BORING LOCATION

D — — — — — D' MATCHLINE

APPROXIMATE SCALE – FEET

0 200 400

BASE AERIAL IMAGE OBTAINED FROM A GOOGLE EARTH IMAGE DATED MARCH 20, 2021.

PLATE 2.3
TEST BORING LOCATION PLAN

HEN-109-06.00, PID 95741
N SEGMENT-APPROX. 2-1/2 MILES: LIBERTY CENTER TO TWP HIGHWAY W
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN TRR/12-5-22	CHECKED LGH/12-7-22
REVISED	APPROVED
JOB NO. 2223901	
DRAWING NUMBER **2223901-02.3G**	

ATL associates inc
Environmental, Geotechnical Engineering & Testing

BASE AERIAL IMAGE OBTAINED FROM A GOOGLE EARTH IMAGE DATED MARCH 20, 2021.

LEGEND

B-049-0-22 APPROXIMATE TEST BORING LOCATION

E E' MATCHLINE

APPROXIMATE SCALE – FEET

0 200 400

PLATE 2.4
TEST BORING LOCATION PLAN
HEN-109-06.00, PID 95741
N SEGMENT-APPROX. 2-1/2 MILES: LIBERTY CENTER TO TWP HIGHWAY W
HENRY COUNTY, OHIO

PREPARED FOR
CARPENTER MARTY
COLUMBUS, OHIO

DRAWN TRR/12-5-22	CHECKED LGH/12-7-22
REVISED	APPROVED
JOB NO. 2223901	
DRAWING NUMBER **2223901-02.4G**	

TTL associates inc
Environmental, Geotechnical Engineering & Testing

FIGURES

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-001-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 699.9 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.254106, -84.036508	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	699.9																		
	699.1																		
AGGREGATE BASE - 5 INCHES	698.7	1																	
VERY STIFF, BROWN, **ELASTIC CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP	697.9		6 3 4	9	83	SS-1A	2.50	1	5	23	26	45	50	31	19	23	A-7-5 (13)	310	
		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, MOIST	695.9	3	2 2 3	7	67	SS-2	2.75	0	3	13	28	56	45	21	24	26	A-7-6 (15)	-	
STIFF TO VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST TO DAMP		4	1 2 2	5	44	SS-3	2.25	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
@5.5': GRAY/BROWN	692.9	5	2 2 1	4	89	SS-4	1.50	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, DAMP	691.4	6	2 6 7	17	100	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		7																	
		8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:43 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 699.2 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.255177, -84.036499

EXPLORATION ID B-002-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	699.2																		
	698.4																		
AGGREGATE BASE - 6 INCHES	697.9	1	2 3 3	8	89	SS-1A	>4.5	7	6	13	29	45	39	23	16	20	A-6b (10)	-	
HARD, GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	697.2	2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST		3	2 2 3	7	78	SS-2	2.00	2	3	12	31	52	46	24	22	25	A-7-6 (14)	300	
		4	2 2 2	5	83	SS-3	1.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	-	
@5.5': BROWN/GRAY	692.2	5 6	2 3 5	10	78	SS-4	1.00	-	-	-	-	-	-	-	-	29	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	690.7	7 8 EOB	5 7 9	21	89	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:43 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 698.9 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.256282, -84.036564

EXPLORATION ID B-003-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	698.9																		
	698.1																		
AGGREGATE BASE - 7 INCHES	697.5	1																	
VERY STIFF TO HARD, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, TRACE ORGANICS, DAMP @2': GRAY, MOIST		2	2 3 4	9	83	SS-1	4.25	4	7	17	28	44	42	25	17	20	A-7-6 (11)	310	
		3	2 2 4	8	78	SS-2	2.25	-	-	-	-	-	-	-	-	25	A-7-6 (V)	-	
@4': SOME SAND	693.4	4	2 2 6	10	83	SS-3	3.00	8	4	17	24	47	45	24	21	28	A-7-6 (13)	-	
VERY STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP	691.9	5 6	2 4 5	12	83	SS-4	2.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	690.4	7 8	4 6 9	20	100	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-004-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 699.5 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.257356, -84.036529		

MATERIAL DESCRIPTION AND NOTES	ELEV. 699.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	698.7																		
AGGREGATE BASE - 6 INCHES	698.2																		
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	697.5	1	3 5 4	12	83	SS-1A	>4.5	4	4	13	28	51	38	21	17	18	A-6b (11)	-	
VERY STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	2 4 5	12	72	SS-2	3.50	2	3	13	27	55	46	23	23	24	A-7-6 (14)	300	
@4': BROWN/GRAY	694.0	4 5	2 2 3	7	83	SS-3	2.50	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
HARD, GRAY/BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, DAMP	692.5	6	2 3 4	9	78	SS-4	>4.5	-	-	-	-	-	-	-	-	19	A-7-6 (V)	-	
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE CALCITE STAIN SEAM, TRACE IRON OXIDE STAIN SEAM, DAMP	691.0	7	3 4 9	17	94	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:43 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-005-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 698.9 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.258427, -84.036598		

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	698.9																		
	698.1																		
AGGREGATE BASE - 6 INCHES	697.6	1																	
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, LITTLE GRAVEL, DAMP TO MOIST		2	3 4 4	10	83	SS-1	3.00	11	5	16	25	43	44	22	22	22	A-7-6 (12)	300	
@2': BROWN/GRAY, LITTLE SAND, TRACE GRAVEL		3	3 4 5	12	94	SS-2	3.75	1	3	15	28	53	46	23	23	20	A-7-6 (14)	-	
		4	5 6 6	16	72	SS-3	2.75	-	-	-	-	-	-	-	-	19	A-7-6 (V)	-	
	693.4	5																	
HARD, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP		6	3 4 5	12	94	SS-4	4.25	-	-	-	-	-	-	-	-	17	A-7-6 (V)	-	
		7	3 9 8	22	89	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-7-6 (V)	-	
	690.4	8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:43 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-006-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 699.2 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.259529, -84.036566		

MATERIAL DESCRIPTION AND NOTES	ELEV. 699.2	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 - 10 INCHES	698.4																		
AGGREGATE BASE - 6 INCHES	697.9	1																	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT. LITTLE SAND, TRACE GRAVEL, DAMP		2	4 3 4	9	78	SS-1	2.75	3	4	14	27	52	44	22	22	21	A-7-6 (14)	310	
@2.5': MOIST	693.7	3	2 3 5	10	83	SS-2	2.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	-	
		4	3 4 4	10	78	SS-3	3.00	2	2	14	26	56	43	22	21	25	A-7-6 (13)	-	
MEDIUM STIFF TO STIFF, BROWN/GRAY, **CLAY**, SOME SILT. LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, MOIST	692.2	5																	
		6	2 3 3	8	89	SS-4	1.00	-	-	-	-	-	-	-	-	26	A-7-6 (V)	-	
HARD, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, DAMP	690.7	7																	
		8	2 6 7	17	100	SS-5	>4.5	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-007-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 698.9 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.260630, -84.036630		

MATERIAL DESCRIPTION AND NOTES	ELEV. 698.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	698.1																		
AGGREGATE BASE - 7 INCHES	697.6																		
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP		1	3 4 3	9	78	SS-1	3.00	4	4	12	24	56	47	23	24	21	A-7-6 (15)	310	
		2																	
		3	3 3 4	9	89	SS-2	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (V)	-	
	694.9	4																	
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		5	5 7 7	18	78	SS-3	>4.5	5	4	12	20	59	38	22	16	17	A-6b (10)	-	
@5.5': BROWN		6	3 6 10	21	89	SS-4	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
@7': TRACE CALCITE STAIN SEAM		7	4 8 11	25	100	SS-5	>4.5	-	-	-	-	-	-	-	-	14	A-6b (V)	-	
	690.4	8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-008-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 697.4 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.261702, -84.036596		

MATERIAL DESCRIPTION AND NOTES	ELEV. 697.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	696.6																		
AGGREGATE BASE - 7 INCHES	696.1																		
STIFF TO VERY STIFF, GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP @2.5': MOIST	693.4	1 2	6 4 4	10	33	SS-1	-	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
		3	4 4 3	9	72	SS-2	2.50	6	9	17	22	46	39	23	16	24	A-6b (9)	300	
MEDIUM STIFF TO STIFF, DARK GRAY/GRAY, **CLAY**, SOME SAND, SOME SILT, TRACE ORGANICS, MOIST	691.9	4 5	1 2 3	7	67	SS-3	1.00	0	6	17	21	56	42	23	19	31	A-7-6 (12)	-	
VERY STIFF TO HARD, BROWN/GRAY, **CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP @7': MOIST	688.9	6 7	3 3 5	10	89	SS-4	3.25	-	-	-	-	-	-	-	-	18	A-7-6 (V)	-	
		8	2 3 4	9	94	SS-5	4.5+	-	-	-	-	-	-	-	-	29	A-7-6 (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-009-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 696.8 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.262808, -84.036664		

MATERIAL DESCRIPTION AND NOTES	ELEV. 696.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8.5 INCHES	696.1																		
AGGREGATE BASE - 9.5 INCHES	695.3																		
STIFF, BROWN/GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP TO MOIST	694.8	1	4 4 4	10	89	SS-1A	1.75	7	9	18	21	45	37	19	18	19	A-6b (9)	300	
STIFF TO VERY STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	2 3 5	10	89	SS-2	1.00	2	4	14	28	52	41	21	20	22	A-7-6 (12)	-	
@4': GRAY/BROWN	691.3	4	2 2 4	8	89	SS-3	2.50	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
HARD, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		6	3 5 6	14	83	SS-4	>4.5	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
	688.3	7 8 EOB	3 5 7	16	89	SS-5	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 697.7 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.263917, -84.036647

EXPLORATION ID B-010-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 697.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	696.9																		
AGGREGATE BASE - 6 INCHES	696.4																		
STIFF TO VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP @2': LITTLE SAND	693.7	1 2	4 5 4	12	83	SS-1	1.75	3	5	19	24	49	42	21	21	20	A-7-6 (12)	-	
		3	3 3 3	8	72	SS-2	3.00	6	3	14	27	50	43	22	21	21	A-7-6 (13)	300	
VERY STIFF TO HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE CALCITE STAIN SEAM, DAMP @5.5': GRAY/BROWN		4 5	3 3 4	9	83	SS-3	>4.5	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
		6	6 7 8	20	72	SS-4	3.75	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
@7': BROWN	689.2	7 8	6 8 10	23	83	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:43 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-011-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 697.1 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.265000, -84.036702		

MATERIAL DESCRIPTION AND NOTES	ELEV. 697.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	696.3																		
AGGREGATE BASE - 6 INCHES	695.8	1																	
VERY STIFF TO HARD, GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP TO MOIST		2	5 4 4	10	67	SS-1	>4.5	6	4	20	25	45	39	20	19	19	A-6b (11)	300	
	693.1	3	3 3 3	8	78	SS-2	3.50	2	4	19	23	52	39	19	20	20	A-6b (12)	-	
STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	691.6	4 5	2 2 2	5	83	SS-3	1.50	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
HARD, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		6	4 5 8	17	72	SS-4	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
@7': BROWN, TRACE IRON OXIDE STAIN SEAM	688.6	7 8 EOB	5 6 9	20	89	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 696.4 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.266116, -84.036680

EXPLORATION ID B-012-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 696.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	695.6																		
AGGREGATE BASE - 6 INCHES	695.1																		
VERY STIFF TO HARD, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP TO MOIST		1	3 4 3	9	89	SS-1	4.25	6	5	16	26	47	43	21	22	21	A-7-6 (13)	-	
		2																	
		3	3 3 4	9	72	SS-2	2.50	1	5	15	26	53	44	22	22	25	A-7-6 (14)	310	
		4																	
		5	2 3 3	8	67	SS-3	4.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
@5.5': BROWN/GRAY		6	2 2 4	8	83	SS-4	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
	689.4	7																	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		8	8 6 10	21	83	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
	687.9	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:44 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-013-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 696.1 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.267215, -84.036734		

MATERIAL DESCRIPTION AND NOTES	ELEV. 696.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9.5 INCHES	695.3																		
AGGREGATE BASE - 8.5 INCHES	694.6																		
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, TRACE ORGANICS, MOIST @2': BROWN/GRAY	690.6	1 2 3 4 5	6 3 3 2 3 3 1 2 2	8 8 5	44 78 72	SS-1 SS-2 SS-3	3.50 2.75 2.00	2 2 -	3 5 -	17 15 -	27 27 -	51 51 -	44 43 -	21 22 -	23 21 -	26 24 26	A-7-6 (14) A-7-6 (13) A-7-6 (V)	310 - -	
MEDIUM STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	689.1	6	2 3 2	7	83	SS-4	0.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	-	
STIFF, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	687.6	7 8 EOB	4 7 8	20	94	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-014-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 696.0 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.268294, -84.036717		

MATERIAL DESCRIPTION AND NOTES	ELEV. 696.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	695.2																		
AGGREGATE BASE - 8 INCHES	694.5																		
HARD, GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, TRACE ORGANICS, MOIST	694.0	1	4 3 4	9	83	SS-1A	4.25	1	5	18	28	48	39	20	19	21	A-6b (12)	-	
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, MOIST		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	2 3 3	8	89	SS-2	2.50	1	4	16	26	53	41	21	20	28	A-7-6 (12)	300	
@4': BROWN/GRAY	690.5	4	3 3 3	8	72	SS-3	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
MEDIUM STIFF, GRAY/BROWN, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, MOIST	689.0	6	2 3 4	9	78	SS-4	0.75	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
STIFF, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	687.5	8 EOB	5 6 8	18	67	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 696.0 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.269388, -84.036767

EXPLORATION ID B-015-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 696.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	695.2																		
AGGREGATE BASE - 6 INCHES	694.7																		
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, TRACE ORGANICS, DAMP @2': LITTLE SAND		1 2	4 5 4	12	78	SS-1	3.50	9	9	11	20	51	47	25	22	24	A-7-6 (13)	250	
@4': MOIST	690.5	3 4	2 3 4	9	72	SS-2	2.75	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
MEDIUM STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST @7': BROWN/GRAY, TRACE ORGANICS		5 6 7	2 3 5	10	44	SS-3	2.00	1	4	11	23	61	42	20	22	29	A-7-6 (13)	-	
			2 2 2	5	83	SS-4	0.50	-	-	-	-	-	-	-	-	32	A-7-6 (V)	-	
	687.5	688.0 8 EOB	2 2 3	7	89	SS-5	0.50	-	-	-	-	-	-	-	-	28	A-7-6 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:44 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 695.1 (NAVD88) EOB: 8.5 ft.
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.270465, -84.036741

EXPLORATION ID B-016-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 695.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	694.3																		
AGGREGATE BASE - 9 INCHES	693.6	1																	
VERY STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, TRACE ORGANICS, DAMP		2	7 4 3	9	33	SS-1	3.75	1	5	11	22	61	47	25	22	23	A-7-6 (14)	260	
@2.5': SOME SAND		3	2 3 3	8	83	SS-2	3.00	1	6	17	26	50	48	25	23	24	A-7-6 (15)	-	
@4': BROWN/GRAY	688.1	4 5 6	1 2 3	7	39	SS-3	3.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
			1 2 3	7	72	SS-4	2.00	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, DAMP	686.6	7 8 EOB	3 5 7	16	78	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:44 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-017-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 694.7 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/13/22 END: 7/13/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.271554, -84.036809		

MATERIAL DESCRIPTION AND NOTES	ELEV. 694.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	693.9																		
AGGREGATE BASE - 6 INCHES	693.4																		
VERY STIFF, GRAY, **CLAY**, SOME SAND, SOME SILT, TRACE GRAVEL, TRACE ORGANICS, MOIST @2': DAMP TO MOIST		1 2	3 3 3	8	67	SS-1	3.75	1	5	23	26	45	48	25	23	27	A-7-6 (14)	-	
@4': LITTLE SAND, DAMP	689.2	3 4 5	5 4 5	12	78	SS-2	4.00	0	4	19	24	53	46	23	23	23	A-7-6 (14)	260	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE IRON OXIDE STAIN SEAM, DAMP	686.2	5 6 7 8	2 4 3	9	56	SS-3	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
		EOB	5 7 6	17	44	SS-4	>4.5	-	-	-	-	-	-	-	-	11	A-6b (V)	-	
			5 8 9	22	50	SS-5	>4.5	-	-	-	-	-	-	-	-	12	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-018-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 694.4 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.272641, -84.036765		

MATERIAL DESCRIPTION AND NOTES	ELEV. 694.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	693.6																		
AGGREGATE BASE - 7 INCHES	693.1	1																	
MEDIUM DENSE, BROWN/GRAY, **SANDY SILT**, LITTLE GRAVEL, TRACE CLAY, TRACE ORGANICS, MOIST	692.4		15 5 4	12	33	SS-1A	-	10	35	19	30	6	NP	NP	NP	16	A-4a (0)	<100	
VERY STIFF, GRAY/BROWN, **CLAY**, WITH SILT, SOME SAND, LITTLE GRAVEL, TRACE ORGANICS, DAMP		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	2 2 4	8	17	SS-2	>4.5	12	12	13	44	19	47	23	24	17	A-7-6 (12)	-	
@4': BROWN/GRAY		4	3 3 4	9	50	SS-3	3.00	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
		5	4 4 3	9	83	SS-4	3.75	-	-	-	-	-	-	-	-	18	A-7-6 (V)	-	
	687.4	6																	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		7	5 6 9	20	100	SS-5	>4.5	-	-	-	-	-	-	-	-	13	A-6b (V)	-	
	685.9 EOB	8																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:44 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-019-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 694.8 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.273746, -84.036829		

MATERIAL DESCRIPTION AND NOTES	ELEV. 694.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8.5 INCHES	694.1																		
AGGREGATE BASE - 7 INCHES	693.5																		
VERY STIFF, BROWN/GRAY, **SILTY CLAY**, WITH ASPHALT FRAGMENTS, SOME SAND, TRACE GRAVEL, DAMP FILL	692.8	1	6 4 3	9	17	SS-1A	2.50	39	10	10	31	10	37	19	18	14	A-6b (3)	-	
VERY STIFF, GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE ASPHALT FRAGMENTS, TRACE GRAVEL, MOIST FILL	690.8	2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	3 2 3	7	39	SS-2	2.75	8	7	10	26	49	42	21	21	23	A-7-6 (13)	260	
STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, TRACE ORGANICS, MOIST	689.3	4 5	3 3 4	9	44	SS-3	1.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
VERY STIFF, GRAY, **SILTY CLAY**, LITLTE SAND, TRACE GRAVEL, MOIST	687.8	6	2 2 2	5	56	SS-4	3.00	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
HARD, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	686.3	7 8 EOB	4 6 7	17	100	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-020-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 694.1 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.274881, -84.036778		

MATERIAL DESCRIPTION AND NOTES	ELEV. 694.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	693.3																		
AGGREGATE BASE - 5 INCHES	692.8	1																	
STIFF TO VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, LITTLE ASPHALT FRAGMENTS, TRACE GRAVEL, DAMP FILL		2	5 5 4	12	50	SS-1	1.50	17	7	10	24	42	42	22	20	21	A-7-6 (11)	260	
@2.5': TRACE ASPHALT FRAGMENTS	690.1	3	4 5 6	14	61	SS-2	3.00	7	6	11	21	55	43	22	21	19	A-7-6 (13)	-	
VERY STIFF, GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	688.6	4	3 3 3	8	67	SS-3	2.00	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	685.6	5 6	3 4 5	12	78	SS-4	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
		7 8 EOB	5 7 9	21	78	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 694.3 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.275956, -84.036870

EXPLORATION ID B-021-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 694.3	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
ASPHALT - 10 INCHES	693.5																		
AGGREGATE BASE - 4 INCHES	693.1																		
HARD, BROWN/GRAY, **SILTY CLAY**, WITH GRAVEL, LITTLE SAND, TRACE ASPHALT FRAGMENTS, MOIST FILL	692.3	1	5 3 4	9	44	SS-1A	>4.5	35	12	6	18	29	36	16	20	18	A-6b (6)	260	
VERY STIFF, GRAY/BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, TRACE ASPHALT FRAGMENTS, MOIST FILL	690.3	2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE ORGANICS, MOIST		3	5 5 5	13	83	SS-2	2.00	1	5	13	23	58	43	20	23	23	A-7-6 (14)	-	
@5.5': GRAY/BROWN, DAMP TO MOIST		4 5 6	2 2 3	7	72	SS-3	>4.5	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
@7': BROWN		7	4 6 6	16	67	SS-4	4.25	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
	685.8 EOB	8	4 6 7	17	83	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-022-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 693.4 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.277045, -84.036822		

MATERIAL DESCRIPTION AND NOTES	ELEV. 693.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	692.6																		
AGGREGATE BASE - 7 INCHES	692.1	1																	
HARD, GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, TRACE ASPHALT FRAGMENTS, DAMP FILL	689.4	2	5 4 5	12	67	SS-1	>4.5	-	-	-	-	-	-	-	-	14	A-6b (V)	-	
		3	3 3 5	10	67	SS-2	>4.5	19	12	13	19	37	37	20	17	13	A-6b (7)	270	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST	687.9	4 5	2 2 4	8	67	SS-3	2.75	1	3	15	20	61	44	22	22	22	A-7-6 (14)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	684.9	6 7	4 4 7	14	78	SS-4	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
		8	5 6 6	16	83	SS-5	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-023-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 693.9 (NAVD88)	EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.278138, -84.036900		

MATERIAL DESCRIPTION AND NOTES	ELEV. 693.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	693.1																		
AGGREGATE BASE - 7 INCHES	692.6																		
VERY STIFF, GRAY, **CLAY**, WITH GRAVEL, SOME SILT, LITTLE SAND, TRACE ASPHALT FRAGMENTS, DAMP FILL @2': LITTLE SILT, TRACE GRAVEL, MOIST	689.9	1 2	6 4 4	10	33	SS-1	3.50	36	7	6	20	31	41	20	21	18	A-7-6 (7)	-	
		3	4 3 4	9	72	SS-2	3.00	6	6	6	19	63	43	21	22	24	A-7-6 (13)	290	
HARD, GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	688.4	4 5	3 2 3	7	72	SS-3	>4.5	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
VERY STIFF, GRAY/BROWN, **CLAY**, SOME SILT. LITTLE SAND, TRACE GRAVEL, MOIST	686.9	6	6 4 4	10	89	SS-4	2.50	-	-	-	-	-	-	-	-	22	A-7-6 (V)	-	
HARD, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	685.4	7 8	3 7 9	21	78	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-024-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 693.5 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.279230, -84.036861		

MATERIAL DESCRIPTION AND NOTES	ELEV. 693.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	692.7																		
AGGREGATE BASE - 6 INCHES	692.2	1																	
VERY STIFF, GRAY, **CLAY**, SOME GRAVEL, LITTLE SILT, LITTLE SAND, TRACE ASPHALT FRAGMENTS, MOIST FILL	691.5	2	5 5 6	14	44	SS-1	2.50	25	7	8	17	43	41	20	21	23	A-7-6 (10)	290	
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP		3	3 3 4	9	67	SS-2	2.50	6	3	18	22	51	45	23	22	19	A-7-6 (13)	-	
@4': HARD		4	4 4 4	10	83	SS-3	>4.5	-	-	-	-	-	-	-	-	13	A-7-6 (V)	-	
@5.5'; STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	686.5	5	3 3 4	9	72	SS-4	1.25	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	685.0	6 7 8 EOB	5 6 8	18	83	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 692.8 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.280317, -84.036952

EXPLORATION ID B-025-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 692.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	692.0																		
AGGREGATE BASE - 7 INCHES	691.5																		
VERY STIFF, BROWN, **CLAY**, SOME SAND, SOME GRAVEL, SOME SILT, TRACE ASPHALT FRAGMENTS, TRACE ORGANICS, DAMP FILL	690.8	1	5 4 3	9	78	SS-1	3.50	27	15	13	23	22	41	20	21	17	A-7-6 (5)	-	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP TO MOIST	687.3	2	2 2 4	8	83	SS-2	3.25	2	4	18	29	47	44	22	22	22	A-7-6 (14)	300	
		3	2 3 3	8	72	SS-3	2.75	-	-	-	-	-	-	-	-	26	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	684.3	4	4 4 5	12	83	SS-4	4.50	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
		5	5 6 7	17	78	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		6																	
		7																	
		8																	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:45 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 692.9 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.281432, -84.036928

EXPLORATION ID B-026-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 692.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9.5 INCHES	692.1																		
AGGREGATE BASE - 6.5 INCHES	691.6																		
VERY STIFF, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, TRACE ASPHALT FRAGMENTS, MOIST FILL	690.9	1	5 5 4	12	67	SS-1	3.75	4	7	18	27	44	45	23	22	26	A-7-6 (13)	280	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, MOIST		2																	
		3	5 4 3	9	67	SS-2	2.25	1	6	20	28	45	44	22	22	27	A-7-6 (13)	-	
@4': GRAY/BROWN, DAMP	687.4	4	3 4 4	10	78	SS-3	3.25	-	-	-	-	-	-	-	-	20	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		5																	
		6	3 6 6	16	83	SS-4	4.50	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
		7																	
		8	6 6 8	18	67	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
	684.4	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 692.9 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.282511, -84.036988

EXPLORATION ID B-027-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 692.9	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	692.1																		
AGGREGATE BASE - 5 INCHES	691.6																		
VERY STIFF, GRAY/BROWN, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, MOIST FILL	690.9	1	5 3 3	8	33	SS-1	2.75	2	5	17	26	50	47	21	26	23	A-7-6 (16)	280	
VERY STIFF, DARK BROWN, **CLAY**, WITH GRAVEL, SOME SILT, SOME SAND, TRACE ASPHALT FRAGMENTS, DAMP FILL		2																	
		3	4 5 5	13	22	SS-2	3.50	39	15	7	30	9	41	20	21	15	A-7-6 (3)	-	
@4': BROWN, LITTLE SAND, TRACE GRAVEL, MOIST	687.4	4	5 6 6	16	67	SS-3	2.75	-	-	-	-	-	-	-	-	25	A-7-6 (V)	-	
STIFF, GRAY/BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	685.9	5	2 2 2	5	78	SS-4	1.50	-	-	-	-	-	-	-	-	31	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	684.4	6	7 9 10	25	83	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		7 EOB																	
		8																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 692.2 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.283626, -84.036964

EXPLORATION ID B-028-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 692.2	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 - 8 INCHES	691.5																		
AGGREGATE BASE - 7 INCHES	690.9	1																	
MEDIUM STIFF, GRAY, **CLAY**, WITH GRAVEL, LITTLE SILT, LITTLE SAND, TRACE ASPHALT FRAGMENTS, DAMP FILL	689.7	2	5 4 4	10	67	SS-1	0.75	36	8	8	19	29	42	21	21	17	A-7-6 (6)	290	
VERY STIFF TO HARD, GRAY/BROWN, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, TRACE ASPHALT FRAGMENTS, DAMP FILL		3	3 4 4	10	67	SS-2	4.50	2	3	20	28	47	43	21	22	18	A-7-6 (13)	-	
@4': BROWN, DAMP TO MOIST	686.7	4 5	3 3 4	9	83	SS-3	2.25	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	683.7	6 7	5 7 4	14	89	SS-4	4.50	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
	EOB	8	6 5 6	14	94	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-029-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 691.5 (NAVD88)	EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.284698, -84.037023		

MATERIAL DESCRIPTION AND NOTES	ELEV. 691.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	690.8																		
AGGREGATE BASE - 7 INCHES	690.2																		
LOOSE, BROWN/BLACK, **ASPHALT FRAGMENTS**, DAMP TO MOIST FILL	689.5	1	11 4 3	9	22	SS-1A	-	-	-	-	-	-	-	-	-	5	UCF (V)	-	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP		2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-7-6 (V)	-	
		3	5 4 3	9	50	SS-2	3.50	6	3	18	25	48	44	22	22	21	A-7-6 (13)	290	
	686.0	4	2 3 2	7	50	SS-3	3.75	2	4	16	26	52	44	23	21	21	A-7-6 (13)	-	
STIFF, GRAY/BROWN, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP	684.5	5	4 4 3	9	78	SS-4	1.50	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	683.0	6	3 5 6	14	83	SS-5	>4.5	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
		7																	
		8																	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:45 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-030-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 691.5 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.285822, -84.037006	

MATERIAL DESCRIPTION AND NOTES	ELEV. 691.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	690.8																		
AGGREGATE BASE - 7 INCHES	690.2																		
HARD, GRAY, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, TRACE ASPHALT FRAGMENTS, MOIST FILL	689.5	1	3 4 3	9	67	SS-1	4.25	4	5	16	26	49	42	20	22	21	A-7-6 (13)	300	
VERY STIFF, BROWN/GRAY, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST	687.5	2	4 3 5	10	83	SS-2	3.50	3	4	13	23	57	43	21	22	21	A-7-6 (13)	-	
VERY STIFF, BROWN/GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	686.0	3	4 3 5	10	50	SS-3	3.00	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
STIFF, GRAY/BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	684.5	4	3 3 2	7	78	SS-4	1.25	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	683.0	5 6 7 8 EOB	5 6 11	22	83	SS-5	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:45 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-031-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 690.4 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.286895, -84.037074		

MATERIAL DESCRIPTION AND NOTES	ELEV. 690.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	689.7																		
AGGREGATE BASE - 9 INCHES	689.0																		
VERY STIFF, GRAY/BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST @2': BROWN		1 2 3 4 5	6 4 4 3 3 5 4 4 6	10 10 13	44 78 72	SS-1 SS-2 SS-3	2.25 3.25 2.50	1 1 -	3 3 -	14 14 -	21 24 -	61 58 -	41 42 -	20 20 -	21 22 -	22 20 20	A-7-6 (13) A-7-6 (13) A-7-6 (V)	310 - -	
	684.9																		
HARD, BROWN, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP TO MOIST @7': LITTLE SAND		6 7	4 5 6 3 7 7	14 18	72 83	SS-4 SS-5	4.50 >4.5	- -	- -	- -	- -	- -	- -	- -	- -	18 15	A-6b (V) A-6b (V)	- -	
	681.9	8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 689.5 (NAVD88) EOB: 8.5 ft.
START: 7/19/22 END: 7/19/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.287978, -84.037046

EXPLORATION ID B-032-0-22

MATERIAL DESCRIPTION AND NOTES	ELEV. 689.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	688.7																		
AGGREGATE BASE - 5 INCHES	688.2																		
VERY STIFF, GRAY/BROWN, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, DAMP TO MOIST @2': LITTLE SAND	685.5	1 2	4 5 4	12	22	SS-1	2.25	3	6	14	22	55	45	22	23	19	A-7-6 (14)	300	
		3	4 4 4	10	67	SS-2	3.50	1	2	9	20	68	44	21	23	21	A-7-6 (14)	-	
HARD, GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	684.0	4 5	4 5 5	13	83	SS-3	4.25	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
MEDIUM STIFF, BROWN, **CLAY**, SOME SILT, LITTLE SAND, TRACE GRAVEL, MOIST	682.5	6	4 4 4	10	78	SS-4	0.50	-	-	-	-	-	-	-	-	27	A-7-6 (V)	-	
HARD, BROWN, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, DAMP	681.0	7 8 EOB	4 6 6	16	78	SS-5	>4.5	-	-	-	-	-	-	-	-	16	A-6b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-033-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 679.3 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1
START: 7/1/22 END: 7/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.450534, -84.008817	

MATERIAL DESCRIPTION AND NOTES	ELEV. 679.3	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
ASPHALT - 9 INCHES	678.5																		
AGGREGATE BASE - 9 INCHES	677.8	1																	
MEDIUM DENSE, BLACK/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE WOOD, TRACE CLAY, TRACE ORGANICS, WET	677.3					SS-1A	-	-	-	-	-	-	-	-	-	-	A-3a (V)	-	
LOOSE TO MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET	674.8	2	7 6 5	14	100	SS-1B	-	2	6	63	27	2	NP	NP	NP	24	A-3a (0)	<100	
		3	2 3 3	8	100	SS-2	-	1	4	66	27	2	NP	NP	NP	20	A-3a (0)	-	
LOOSE, BROWN/GRAY, **FINE SAND**, TRACE SILT, MOIST TO WET	673.3	4 5	2 4 4	10	100	SS-3	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET		6 7	3 4 5	12	100	SS-4	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	
@7.5': WET (FREE WATER NOTED)	670.3	8	5 5 5	13	100	SS-5	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
		EOB 9																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:45 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 679.1 (NAVD88) EOB: 9.5 ft.
START: 7/1/22 END: 7/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.451578, -84.008760

EXPLORATION ID B-034-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 679.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	678.3																		
AGGREGATE BASE - 15 INCHES	677.1	1																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST	675.6	2	8 5 5	13	100	SS-1	-	1	5	67	25	2	NP	NP	NP	14	A-3a (0)	<100	
LOOSE, GRAY/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET	674.1	3 4	2 3 4	9	100	SS-2	-	0	4	64	30	2	NP	NP	NP	19	A-3a (0)	-	
LOOSE, BROWN/GRAY, **FINE SAND**, TRACE SILT, MOIST TO WET	672.6	5 6	2 2 3	7	100	SS-3	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
LOOSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, WET (FREE WATER NOTED)	669.6	7 8	2 2 4	8	100	SS-4	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	
@8': MEDIUM DENSE (FREE WATER NOTED)		9 EOB	5 4 6	13	100	SS-5	-	-	-	-	-	-	-	-	-	28	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; PLACED AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:45 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-035-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.4 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1
START: 7/1/22 END: 7/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.452683, -84.008802	

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	680.6																		
AGGREGATE BASE - 9 INCHES	679.9																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST			7 9 8	22	67	SS-1	-	2	3	70	23	2	NP	NP	NP	10	A-3a (0)	-	
@3': TRACE IRON OXIDE STAIN SEAM	676.9		4 6 5	14	78	SS-2	-	1	3	73	21	2	NP	NP	NP	18	A-3a (0)	<100	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE GRAVEL, TRACE SANDSTONE FRAGMENTS, TRACE SILT, MOIST TO WET			3 5 4	12	67	SS-3	-	-	-	-	-	-	-	-	-	19	A-3 (V)	-	
W 675.4																			
@6': WET, GRAY (FREE WATER NOTED)			4 5 5	13	89	SS-4	-	-	-	-	-	-	-	-	-	21	A-3 (V)	-	
@7.5': (FREE WATER NOTED)			7 7 3	13	78	SS-5	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
	672.4	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-036-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.6 (NAVD88) EOB: 8.9 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.453769, -84.008746	

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	680.0																		
AGGREGATE BASE - 9 INCHES	679.3																		
MEDIUM DENSE, BROWN/GRAY, **COARSE AND FINE SAND**, SOME SILT, LITTLE GRAVEL, TRACE CLAY, MOIST	677.7		6 9 8	22	50	SS-1	-	12	4	62	20	2	NP	NP	NP	13	A-3a (0)	<100	
LOOSE, BROWN/GRAY, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET			4 4 4	10	56	SS-2	-	1	2	80	15	2	NP	NP	NP	19	A-3a (0)	-	
@4.4': SOME SILT, LITTLE GRAVEL			3 2 3	7	61	SS-3	-	-	-	-	-	-	-	-	-	16	A-3a (V)	-	
@5.9': MEDIUM DENSE, GRAY, TRACE GRAVEL	673.2	674.6	3 4 6	13	56	SS-4	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)	671.7	EOB	4 4 5	12	50	SS-5	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-037-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 678.6 (NAVD88) EOB: 9.2 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.454846, -84.008814	

MATERIAL DESCRIPTION AND NOTES	ELEV. 678.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	678.0																		
AGGREGATE BASE - 11 INCHES	677.1																		
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST			7 9 9	23	67	SS-1	-	1	2	75	20	2	NP	NP	NP	17	A-3a (0)	<100	
@3.2': GRAY/BROWN, LITTLE SILT, MOIST TO WET			4 6 6	16	61	SS-2	-	0	1	78	19	2	NP	NP	NP	19	A-3a (0)	-	
@4.7': BROWN/GRAY, WET (FREE WATER NOTED)		W 673.9	2 7 7	18	56	SS-3	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	
@6.4': GRAY (FREE WATER NOTED)	670.9		5 5 6	14	50	SS-4	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
LOOSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST	669.4	EOB	3 3 4	9	44	SS-5	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-038-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 679.4 (NAVD88) EOB: 9.2 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.455932, -84.008749	

MATERIAL DESCRIPTION AND NOTES	ELEV. 679.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	678.8																		
AGGREGATE BASE - 11 INCHES	677.9																		
LOOSE, BLACK/BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET @2': BROWN, SOME SILT			3 3 4	9	67	SS-1	-	2	3	78	15	2	NP	NP	NP	21	A-3a (0)	-	
			3 3 4	9	78	SS-2	-	0	8	69	21	2	NP	NP	NP	20	A-3a (0)	<100	
	673.1	673.1	3 3 5	10	67	SS-3	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED) @7.7': (FREE WATER NOTED)			3 5 7	16	67	SS-4	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
	670.2	EOB	4 4 5	12	72	SS-5	-	-	-	-	-	-	-	-	-	25	A-3 (V)	-	

F.S.

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-039-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 679.8 (NAVD88) EOB: 8.7 ft.	PAGE 1 OF 1	
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.457024, -84.008803		

MATERIAL DESCRIPTION AND NOTES	ELEV. 679.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	679.0																		
AGGREGATE BASE - 5 INCHES	678.5																		
MEDIUM DENSE, BROWN/GRAY, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY. TRACE GRAVEL, MOIST	677.0		8 9 8	22	67	SS-1	-	2	3	81	12	2	NP	NP	NP	16	A-3a (0)	<100	
LOOSE, BROWN/GRAY, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET	675.6		4 3 4	9	72	SS-2	-	0	2	81	15	2	NP	NP	NP	19	A-3a (0)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SANDSTONE FRAGMENTS, TRACE SILT, MOIST TO WET	674.1		6 6 8	18	89	SS-3	-	-	-	-	-	-	-	-	-	20	A-3 (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET @7': WET	671.1	672.8	4 4 6	13	72	SS-4	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
		EOB	3 5 6	14	78	SS-5	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-040-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.5 (NAVD88) EOB: 8.7 ft.	PAGE 1 OF 1	
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.458139, -84.008750		

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	679.7																		
AGGREGATE BASE - 5 INCHES	679.2																		
MEDIUM DENSE, DARK BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	678.0		8 6 6	16	78	SS-1	-	1	3	76	18	2	NP	NP	NP	16	A-3a (0)	140	
LOOSE, BROWN/GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST @4.2': GRAY/BROWN, TRACE GRAVEL	674.5		4 3 3	8	83	SS-2	-	0	2	74	22	2	NP	NP	NP	18	A-3a (0)	-	
			1 3 3	8	78	SS-3	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET @7.2': GRAY, WET	671.8	673.0	5 9 10	25	78	SS-4	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	
		EOB	6 7 6	17	83	SS-5	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-041-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.8 (NAVD88) EOB: 8.8 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.459253, -84.008803	

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	681.0																		
AGGREGATE BASE - 6 INCHES	680.5																		
MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, DAMP	679.3		2 7 7	18	83	SS-1	-	1	2	79	16	2	NP	NP	NP	10	A-3a (0)	130	
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	676.8		2 3 3	8	72	SS-2	-	1	3	76	18	2	NP	NP	NP	18	A-3a (0)	-	
			4 5 7	16	78	SS-3A	-	-	-	-	-	-	-	-	-	-	A-3a (V)	-	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, WET						SS-3B	-	-	-	-	-	-	-	-	-	20	A-3 (V)	-	
@5.8': GRAY, TRACE GRAVEL	674.5	675.7 ▼	4 8 8	21	72	SS-4	-	-	-	-	-	-	-	-	-	18	A-3 (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, WET	673.0	EOB	4 7 8	20	72	SS-5	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-042-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.6 (NAVD88) EOB: 8.7 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.460344, -84.008742	

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	679.8																		
AGGREGATE BASE - 5 INCHES	679.4																		
MEDIUM DENSE, DARK BROWN/BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, MOIST	678.1		7 8 7	20	67	SS-1	-	3	3	77	15	2	NP	NP	NP	12	A-3a (0)	130	
LOOSE, DARK GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST	676.4		4 3 4	9	78	SS-2	-	0	7	60	31	2	NP	NP	NP	19	A-3a (0)	-	
MEDIUM STIFF, GRAY, **SILTY CLAY**, LITTLE SAND, MOIST	674.9		1 2 1	4	83	SS-3	0.75	-	-	-	-	-	-	-	-	27	A-6b (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, MOIST TO WET		673.5	3 6 7	17	89	SS-4	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	
@7.1': WET	671.9	EOB	4 7 7	18	72	SS-5	-	-	-	-	-	-	-	-	-	25	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-043-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 679.8 (NAVD88) EOB: 8.7 ft.	PAGE 1 OF 1	
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.461421, -84.008796		

MATERIAL DESCRIPTION AND NOTES	ELEV. 679.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	679.2																		
AGGREGATE BASE - 13 INCHES	678.1																		
MEDIUM DENSE, DARK GRAY, **COARSE AND FINE SAND**, SOME SILT, LITTLE GRAVEL, TRACE CLAY, MOIST	677.1		5 7 7	18	78	SS-1	-	10	4	58	26	2	NP	NP	NP	16	A-3a (0)	<100	
LOOSE, BROWN/DARK GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST			2 3 5	10	83	SS-2	-	0	2	65	31	2	NP	NP	NP	18	A-3a (0)	-	
@4.2': GRAY	673.8		2 2 4	8	72	SS-3	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, WET		672.8	4 8 10	23	83	SS-4	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
	671.1	EOB	3 4 7	14	78	SS-5	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-044-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.6 (NAVD88) EOB: 8.8 ft.	PAGE 1 OF 1
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.462537, -84.008731	

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	680.0																		
AGGREGATE BASE - 14 INCHES	678.8																		
LOOSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET FILL			3 3 3	8	72	SS-1	-	1	2	68	27	2	NP	NP	NP	15	A-3a (0)	-	
@3': BROWN/GRAY, TRACE ASPHALT FRAGMENTS			2 2 2	5	83	SS-2	-	1	3	61	32	3	NP	NP	NP	19	A-3a (0)	<100	
	674.8		2 1 2	4	83	SS-3	-	-	-	-	-	-	-	-	-	18	A-3a (V)	-	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)		674.2 ▼	3 6 7	17	72	SS-4	-	-	-	-	-	-	-	-	-	25	A-3 (V)	-	
@7.3': (FREE WATER NOTED)	671.8	EOB	3 4 7	14	78	SS-5	-	-	-	-	-	-	-	-	-	27	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:46 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-045-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.3 (NAVD88) EOB: 8.8 ft.	PAGE 1 OF 1	
START: 7/5/22 END: 7/5/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.463641, -84.008792		

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.3	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
ASPHALT - 7 INCHES	679.7																		
AGGREGATE BASE - 14 INCHES	678.5																		
MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE GRAVEL, TRACE CLAY, TRACE IRON OXIDE STAIN SEAM, MOIST	677.8		4 8 7	20	67	SS-1	-	6	5	57	30	2	NP	NP	NP	19	A-3a (0)	<100	
MEDIUM STIFF, GRAY/BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST TO WET	675.5		2 2 3	7	83	SS-2	-	3	2	41	35	19	19	16	3	17	A-4a (4)	-	
STIFF, GRAY/BROWN, **SILTY CLAY**, LITTLE SAND, MOIST	673.7	673.7	2 1 3	5	89	SS-3A	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
						SS-3B	1.75	-	-	-	-	-	-	-	-	25	A-6b (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, MOIST (FREE WATER NOTED) @7.3': (FREE WATER NOTED)	671.5	EOB	3 7 5	16	72	SS-4A	-	-	-	-	-	-	-	-	-	-	A-6b (V)	-	
						SS-4B	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	
			3 5 6	14	67	SS-5	-	-	-	-	-	-	-	-	-	28	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-046-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.3 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.464741, -84.008729	

MATERIAL DESCRIPTION AND NOTES	ELEV.	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	680.3																		
	679.7																		
AGGREGATE BASE - 5 INCHES	679.3																		
MEDIUM DENSE, BROWN/GRAY, **SANDY SILT**, TRACE CLAY, MOIST		1	6 5 5	13	78	SS-1A	-	0	3	61	32	4	NP	NP	NP	16	A-4a (0)	<100	
	678.3	2				SS-1B	-	-	-	-	-	-	-	-	-	-	A-3a (V)	-	
LOOSE, ORANGE/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET		3	3 3 5	10	83	SS-2	-	0	1	77	20	2	NP	NP	NP	20	A-3a (0)	-	
@4': BROWN		4	4 4 6	13	72	SS-3A	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
	675.3	5				SS-3B	-	-	-	-	-	-	-	-	-	-	A-3 (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)		W 674.3 6	4 8 11	25	78	SS-4	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	
@7': (FREE WATER NOTED)		7	3 5 7	16	67	SS-5	-	-	-	-	-	-	-	-	-	27	A-3 (V)	-	
	671.8	EOB 8																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-047-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.4 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.465797, -84.008782	

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	679.7																		
AGGREGATE BASE - 10 INCHES	678.9																		
LOOSE, BLACK, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, TRACE ORGANICS, MOIST TO WET	677.4		3 3 2	7	83	SS-1	-	1	7	64	26	2	NP	NP	NP	21	A-3a (0)	-	
STIFF, BLACK, **SANDY SILT**, TRACE CLAY, TRACE ORGANICS, MOIST TO WET	675.9		1 2 2	5	83	SS-2	2.00	0	9	49	37	5	-	-	-	24	A-4a (V)	120	
LOOSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, MOIST TO WET	674.4		2 3 3	8	72	SS-3	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)		674.1	1 2 3	7	67	SS-4	-	-	-	-	-	-	-	-	-	27	A-3 (V)	-	
@7.5': MEDIUM DENSE (FREE WATER NOTED)	671.4	EOB	3 5 5	13	67	SS-5	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-048-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.6 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.466920, -84.008712	

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7 INCHES	681.0																		
AGGREGATE BASE - 11 INCHES	680.1																		
LOOSE TO MEDIUM DENSE, DARK BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, TRACE ORGANICS, MOIST TO WET			4 4 5	12	78	SS-1	-	1	4	62	31	2	NP	NP	NP	21	A-3a (0)	<100	
			3 3 4	9	72	SS-2	-	1	6	59	31	3	NP	NP	NP	20	A-3a (0)	-	
@5': GRAY/BROWN	675.6		1 2 2	5	83	SS-3	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, MOIST TO WET		▼ 675.3	3 4 9	17	72	SS-4	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
@7.5': WET, GRAY (FREE WATER NOTED)	672.6	EOB	5 7 7	18	67	SS-5	-	-	-	-	-	-	-	-	-	27	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-049-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.1 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1	
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.467915, -84.008785		

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	680.4																		
AGGREGATE BASE - 10 INCHES	679.6																		
LOOSE, BLACK, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, TRACE ORGANICS, MOIST TO WET			4 4 3	9	72	SS-1	-	1	25	45	27	2	NP	NP	NP	29	A-3a (0)	<100	
@2': GRAY	676.6		2 3 4	9	83	SS-2	-	0	4	68	26	2	NP	NP	NP	16	A-3a (0)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, MOIST			4 5 4	12	67	SS-3	-	-	-	-	-	-	-	-	-	15	A-3 (V)	-	
@6': WET (FREE WATER NOTED)	673.6	674.8	5 5 5	13	78	SS-4	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)	672.1	EOB	5 7 8	20	67	SS-5	-	-	-	-	-	-	-	-	-	28	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-050-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.4 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1	
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.468940, -84.008722		

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 10 INCHES	681.6																		
AGGREGATE BASE - 8 INCHES	680.9																		
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST			6 6 5	14	78	SS-1	-	0	7	70	21	2	NP	NP	NP	9	A-3a (0)	150	
@3': BROWN/GRAY, MOIST TO WET			4 4 3	9	83	SS-2	-	0	4	62	32	2	NP	NP	NP	17	A-3a (0)	-	
@4.5': GRAY/BROWN	676.4		3 4 5	12	72	SS-3	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)		676.2	2 3 5	10	78	SS-4	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	
@7.5': MEDIUM DENSE (FREE WATER NOTED)	673.4	EOB	3 5 6	14	67	SS-5	-	-	-	-	-	-	-	-	-	24	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-051-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.8 (NAVD88) EOB: 8.9 ft.	PAGE 1 OF 1
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.470035, -84.008782	

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	682.1																		
AGGREGATE BASE - 9 INCHES	681.4																		
LOOSE, ORANGE, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, MOIST			4 4 4	10	78	SS-1	-	0	4	77	17	2	NP	NP	NP	11	A-3a (0)	<100	
@2.5': ORANGE/BROWN, SOME SILT			2 2 3	7	72	SS-2	-	0	2	73	23	2	NP	NP	NP	15	A-3a (0)	-	
@4.4' : BROWN, TRACE GRAVEL	676.8	W 676.9	2 2 3	7	83	SS-3	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)			3 4 6	13	72	SS-4	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
@7.4': (FREE WATER NOTED)	673.9	EOB	2 4 4	10	89	SS-5	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-052-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.4 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1	
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.471103, -84.008695		

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	681.6																		
AGGREGATE BASE - 9 INCHES	680.9	1																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	679.4	2	5 4 5	12	67	SS-1	-	1	5	79	13	2	NP	NP	NP	11	A-3a (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND**, SOMESILT	677.9	3 4	3 2 2	5	72	SS-2	-	0	2	66	30	2	NP	NP	NP	18	A-3a (0)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)		5	2 3 5	10	78	SS-3	-	-	-	-	-	-	-	-	-	19	A-3 (V)	-	
		676.6 ▼																	
@6': (FREE WATER NOTED)	F.S.	6 7	3 3 5	10	72	SS-4	-	-	-	-	-	-	-	-	-	28	A-3 (V)	-	
@7.5': (FREE WATER NOTED)	673.4	8	1 2 5	9	83	SS-5	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
		EOB 9																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-053-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.0 (NAVD88) EOB: 9.0 ft.	PAGE 1 OF 1	
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.472051, -84.008776		

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	681.2																		
AGGREGATE BASE - 8 INCHES	680.6																		
MEDIUM DENSE, DARK BROWN/BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	679.0		5 6 7	17	67	SS-1	-	2	3	86	7	2	NP	NP	NP	13	A-3 (0)	110	
LOOSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST	677.5		2 3 4	9	83	SS-2	-	0	1	89	8	2	NP	NP	NP	17	A-3 (0)	-	
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET			2 2 3	7	89	SS-3	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	
@6': TRACE GRAVEL		675.0	4 3 5	10	67	SS-4	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
@7.5': WET, GRAY (FREE WATER NOTED)	673.0	EOB	2 3 5	10	78	SS-5	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-054-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.8 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.473141, -84.008702		

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.8	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	682.1																		
AGGREGATE BASE - 9 INCHES	681.4																		
MEDIUM DENSE, BROWN/BLACK, **ASPHALT FRAGMENTS**, LITTLE SAND, LITTLE CRUSHED STONE, DAMP FILL	680.8	1	5 6 6	16	44	SS-1	-	-	-	-	-	-	-	-	-	4	UCF (V)	-	
MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, LITTLE SILT, TRACE CLAY, MOIST	678.8	2 3	10 5 6	14	50	SS-2	-	16	8	59	15	2	NP	NP	NP	12	A-3a (0)	110	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST	676.8	4 5	4 5 7	16	72	SS-3	-	0	3	88	7	2	NP	NP	NP	18	A-3 (0)	-	
MEDIUM DENSE, BROWN/GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, MOIST TO WET		6	2 5 7	16	39	SS-4	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
▼ 675.8		7																	
@7': GRAY/BROWN, TRACE GRAVEL		8	8 9 11	26	50	SS-5	-	-	-	-	-	-	-	-	-	21	A-3a (V)	-	
	674.3	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:47 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-055-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 683.6 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/11/22 END: 7/11/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.474217, -84.008769		

MATERIAL DESCRIPTION AND NOTES	ELEV. 683.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	682.9																		
AGGREGATE BASE - 10 INCHES	682.1																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, MOIST TO WET	681.1	1	6 5 5	13	39	SS-1	-	0	4	83	11	2	NP	NP	NP	18	A-3a (0)	<100	
LOOSE, BROWN/DARK BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, MOIST		2	2 2 3	7	67	SS-2	-	8	13	64	13	2	NP	NP	NP	13	A-3a (0)	-	
@4': BROWN		3	3 3 2	7	78	SS-3	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
@5': SOME SILT, WET		4																	
		5																	
		6	2 3 4	9	39	SS-4	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
	676.6	7																	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)	675.1	8	3 5 6	14	67	SS-5	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	

▼ W 678.3

EOB

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 684.4 (NAVD88) EOB: 8.5 ft.
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.475215, -84.008712

EXPLORATION ID B-056-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 684.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	683.6																		
AGGREGATE BASE - 9 INCHES	682.9																		
LOOSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, MOIST			6 4 4	10	33	SS-1	-	1	6	83	8	2	NP	NP	NP	6	A-3 (0)	<100	
F S			4 3 4	9	39	SS-2	-	0	4	87	7	2	NP	NP	NP	6	A-3 (0)	-	
	679.4	W 679.4	3 2 2	5	50	SS-3A	-	-	-	-	-	-	-	-	-	-	A-3 (V)	-	
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, WET	678.9					SS-3B	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
LOOSE, BROWN, **FINE SAND**, TRACE SILT, WET			2 3 2	7	78	SS-4	-	-	-	-	-	-	-	-	-	20	A-3 (V)	-	
F S	677.4																		
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, WET			5 6 6	16	67	SS-5	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
F S	675.9	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-057-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.2 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.476270, -84.008761	

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.2	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 - 7.5 INCHES	681.6																		
AGGREGATE BASE - 10.5 INCHES	680.7																		
MEDIUM DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST	679.7	1	5 7 6	17	17	SS-1	-	1	12	58	26	3	NP	NP	NP	9	A-3a (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET		2	3 3 3	8	39	SS-2	-	1	3	75	19	2	NP	NP	NP	17	A-3a (0)	-	
		3	2 2 3	7	72	SS-3	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
@6': WET (FREE WATER NOTED)	675.2	4 W 676.2 5 6	3 4 4	10	44	SS-4	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, TRACE CLAY, WET (FREE WATER NOTED)	673.7	7 8 EOB	3 5 8	17	100	SS-5	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-058-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 683.0 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.477373, -84.008686	

MATERIAL DESCRIPTION AND NOTES	ELEV. 683.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	682.3																		
AGGREGATE BASE - 6 INCHES	681.8																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	681.0	1	5 7 6	17	44	SS-1	-	1	5	82	10	2	NP	NP	NP	6	A-3a (0)	110	
LOOSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST		2																	
		3	3 3 4	9	44	SS-2	-	0	7	83	8	2	NP	NP	NP	9	A-3 (0)	-	
@4': TRACE GRAVEL		4																	
			3 3 4	9	39	SS-3	-	-	-	-	-	-	-	-	-	11	A-3 (V)	-	
	677.0	5																	
VERY LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, WET (FREE WATER NOTED)		W 677.0 6	2 1 2	4	44	SS-4	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
@7': LOOSE, GRAY (FREE WATER NOTED)		7																	
			2 3 5	10	56	SS-5	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	
	674.5	8 EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-059-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 680.6 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.478448, -84.008768		

MATERIAL DESCRIPTION AND NOTES	ELEV. 680.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	679.9																		
AGGREGATE BASE - 10 INCHES	679.1	1																	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, MOIST		2	7 5 5	13	39	SS-1	-	3	4	72	19	2	NP	NP	NP	13	A-3a (0)	<100	
@2.5': RED/BROWN		3	2 2 3	7	36	SS-2	-	-	-	-	-	-	-	-	-	14	A-3a (V)	-	
		4																	
		5	3 3 2	7	67	SS-3	-	1	3	72	22	2	NP	NP	NP	21	A-3a (0)	-	
@5': BROWN, SOME SILT																			
W 675.1																			
@5.5': WET (FREE WATER NOTED)		6	1 3 5	10	39	SS-4	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	
	673.6	7																	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, WET (FREE WATER NOTED)			5 5 6	14	78	SS-5	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
F.S.	672.1	8																	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-060-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.1 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.479557, -84.008709		

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8.5 INCHES	680.4																		
AGGREGATE BASE - 9.5 INCHES	679.6																		
MEDIUM DENSE, BLACK, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST	678.6	1	6 5 5	13	0	SS-1	-	-	-	-	-	-	-	-	-	-	A-4a (V)	-	
LOOSE, BLACK, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST		2																	
		3	3 4 3	9	83	SS-2	-	1	7	67	23	2	NP	NP	NP	20	A-3a (0)	<100	
@4': GRAY		4																	
		5	2 3 3	8	44	SS-3	-	0	4	71	23	2	NP	NP	NP	20	A-3a (0)	-	
@6': WET, TRACE ORGANICS (FREE WATER NOTED)	674.1	W 675.1 6	3 3 4	9	44	SS-4	-	-	-	-	-	-	-	-	-	29	A-3a (V)	-	
LOOSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)	672.6	7	2 3 3	8	33	SS-5	-	-	-	-	-	-	-	-	-	28	A-3 (V)	-	
		EOB 8																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-061-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL	
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 681.6 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.480500, -84.008775	

MATERIAL DESCRIPTION AND NOTES	ELEV. 681.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	680.9																		
AGGREGATE BASE - 10 INCHES	680.1																		
LOOSE, BLACK/BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE GRAVEL, TRACE CLAY, MOIST		1	8 4 3	9	22	SS-1	-	4	17	45	31	3	NP	NP	NP	20	A-3a (0)	<100	
@2.5': BROWN	677.6	2 3	3 3 3	8	56	SS-2	-	1	1	68	28	2	NP	NP	NP	17	A-3a (0)	-	
LOOSE, GRAY/BROWN, **FINE SAND**, TRACE GRAVEL, TRACE SILT, MOIST	675.6	4 5	2 3 3	8	67	SS-3	-	-	-	-	-	-	-	-	-	20	A-3 (V)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, WET (FREE WATER NOTED)	674.6	W 675.6 6 7	5 5 6	14	44	SS-4	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, WET	673.1	8 EOB	5 7 8	20	50	SS-5	-	-	-	-	-	-	-	-	-	21	A-3a (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 684.5 (NAVD88) EOB: 8.5 ft.
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.481531, -84.008704

EXPLORATION ID B-062-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 684.5	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	683.7																		
AGGREGATE BASE - 9 INCHES	683.0																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	682.0	1	5 6 5	14	44	SS-1	-	1	8	71	18	2	NP	NP	NP	7	A-3a (0)	100	
LOOSE, BROWN/GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET		2	2 2 3	7	44	SS-2	-	1	6	68	23	2	NP	NP	NP	21	A-3a (0)	-	
@4': GRAY		3	1 2 2	5	44	SS-3	-	-	-	-	-	-	-	-	-	12	A-3a (V)	-	
		4	2 2 3	7	67	SS-4	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
		5	3 2 3	7	39	SS-5	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
	676.0	6 EOB																	
		7																	
		8																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / JW	DRILL RIG: CME 550X ATV	STATION / OFFSET:	EXPLORATION ID B-063-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: CME AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: HSA	CALIBRATION DATE: 3/15/21	ELEVATION: 682.7 (NAVD88) EOB: 8.5 ft.	PAGE 1 OF 1	
START: 7/12/22 END: 7/12/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 78.1	LAT / LONG: 41.482608, -84.008774		

MATERIAL DESCRIPTION AND NOTES	ELEV. 682.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 9 INCHES	681.9																		
AGGREGATE BASE - 6 INCHES	681.4																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE GRAVEL, TRACE CLAY, MOIST		1	7 5 7	16	33	SS-1	-	3	7	65	23	2	NP	NP	NP	12	A-3a (0)	-	
@2.5': GRAY, TRACE ORGANICS	678.7	3	3 5 6	14	100	SS-2	-	1	6	68	23	2	NP	NP	NP	17	A-3a (0)	120	
LOOSE, GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE ORGANICS, MOIST	676.7	4	2 4 4	10	100	SS-3	-	-	-	-	-	-	-	-	-	15	A-3a (V)	-	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, MOIST TO WET		6	4 5 7	16	100	SS-4	-	-	-	-	-	-	-	-	-	19	A-3 (V)	-	
F.S.	675.5	7																	
	674.2	8	4 8 7	20	100	SS-5	-	-	-	-	-	-	-	-	-	23	A-3 (V)	-	
		EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; BACKFILLED WITH AUGER CUTTINGS

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / TB	DRILL RIG: DIETRICH D70 TRACK /01	STATION / OFFSET:	EXPLORATION ID B-064-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: SSA	CALIBRATION DATE: 4/13/22	ELEVATION: 688.1 (NAVD88) EOB: 7.5 ft.	PAGE 1 OF 1	
START: 7/26/22 END: 7/26/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90	LAT / LONG: 41.483725, -84.008710		

MATERIAL DESCRIPTION AND NOTES	ELEV. 688.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 7.5 INCHES	687.5																		
AGGREGATE BASE -13.5 INCHES	686.3	1																	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST		2	17 10 8	27	89	SS-1	-	0	5	86	7	2	NP	NP	NP	7	A-3 (0)	120	
@3': TRACE GRAVEL		3	5 6 6	18	100	SS-2	-	1	2	89	6	2	NP	NP	NP	8	A-3 (0)	-	
		4																	
		5	4 5 4	14	100	SS-3	-	-	-	-	-	-	-	-	-	10	A-3 (V)	-	
@5.7': RED/BROWN		6																	
		7	4 6 9	23	100	SS-4	-	-	-	-	-	-	-	-	-	9	A-3 (V)	-	
@7.5': BROWN	680.6	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; AUGER CUTTINGS MIXED WITH 0.5 BAG BENTONITE CHIPS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / TB	DRILL RIG: DIETRICH D70 TRACK /01	STATION / OFFSET:	EXPLORATION ID B-065-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: SSA	CALIBRATION DATE: 4/13/22	ELEVATION: 683.3 (NAVD88) EOB: 7.5 ft.	PAGE 1 OF 1	
START: 7/26/22 END: 7/26/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90	LAT / LONG: 41.484801, -84.008751		

MATERIAL DESCRIPTION AND NOTES	ELEV. 683.3	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
ASPHALT - 7.5 INCHES	682.7																		
AGGREGATE BASE - 10.5 INCHES	681.8	1																	
MEDIUM DENSE, DARK BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, MOIST		2	10 13 12	38	94	SS-1	-	3	4	81	10	2	NP	NP	NP	11	A-3a (0)	<100	
@3': BLACK, SOME SILT	678.5	3	7 6 7	20	94	SS-2	-	1	6	66	25	2	NP	NP	NP	24	A-3a (0)	-	
MEDIUM DENSE, GRAY, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST		4	4 4 5	14	100	SS-3	-	-	-	-	-	-	-	-	-	15	A-3 (V)	-	
F.S.		5	5 7 12	29	100	SS-4	-	-	-	-	-	-	-	-	-	15	A-3 (V)	-	
	675.8 EOB	6																	
		7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; AUGER CUTTINGS MIXED WITH 0.5 BAG BENTONITE CHIPS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:48 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / TB	DRILL RIG: DIETRICH D70 TRACK /01	STATION / OFFSET:	EXPLORATION ID B-066-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: SSA	CALIBRATION DATE: 4/13/22	ELEVATION: 686.3 (NAVD88) EOB: 7.5 ft.	PAGE 1 OF 1	
START: 7/26/22 END: 7/26/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90	LAT / LONG: 41.485645, -84.008693		

MATERIAL DESCRIPTION AND NOTES	ELEV. 686.3	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
ASPHALT - 8.5 INCHES	685.6																		
AGGREGATE BASE - 12.5 INCHES	684.5																		
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, DAMP TO MOIST		1																	
		2	15 10 9	29	94	SS-1	-	1	5	86	6	2	NP	NP	NP	5	A-3 (0)	130	
		3	5 6 7	20	100	SS-2	-	0	4	89	5	2	NP	NP	NP	6	A-3 (0)	-	
		4	4 4 5	14	100	SS-3	-	-	-	-	-	-	-	-	-	11	A-3 (V)	-	
		5	4 5 5	15	100	SS-4	-	-	-	-	-	-	-	-	-	16	A-3 (V)	-	
	678.8	6 EOB																	
		7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; AUGER CUTTINGS MIXED WITH 0.5 BAG BENTONITE CHIPS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 2/13/23 14:49 - S:\PROJECTS\2223901.GPJ

PROJECT: HEN-109-06.00	DRILLING FIRM / OPERATOR: TTL / TB	DRILL RIG: DIETRICH D70 TRACK /01	STATION / OFFSET:	EXPLORATION ID B-067-0-22	
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: TTL / KKC	HAMMER: DIEDRICH AUTOMATIC	ALIGNMENT: HEN-190 CL		
PID: 95741 SFN: N/A	DRILLING METHOD: SSA	CALIBRATION DATE: 4/13/22	ELEVATION: 685.1 (NAVD88) EOB: 7.0 ft.	PAGE 1 OF 1	
START: 7/26/22 END: 7/26/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90	LAT / LONG: 41.486487, -84.008767		

MATERIAL DESCRIPTION AND NOTES	ELEV. 685.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
ASPHALT - 8 INCHES	684.4																		
AGGREGATE BASE - 9 INCHES	683.7																		
DENSE, GRAY/BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST	682.6	1	20 15 13	42	89	SS-1	-	2	5	78	13	2	NP	NP	NP	7	A-3a (0)	140	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE SILT, TRACE CLAY, MOIST		2																	
		3	10 9 10	29	100	SS-2	-	0	3	90	5	2	NP	NP	NP	9	A-3 (0)	-	
		4																	
		5	7 6 6	18	100	SS-3	-	-	-	-	-	-	-	-	-	16	A-3 (V)	-	
@5.5': MOIST TO WET		6																	
	678.1	EOB 7	4 4 5	14	100	SS-4	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.25 BAG ASPHALT PATCH; AUGER CUTTINGS MIXED WITH 0.5 BAG BENTONITE CHIPS

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

A-3: Ohio DOT: A-3, fine sand


A-3A: Ohio DOT: A-3a, coarse and fine sand


A-4A: Ohio DOT: A-4a, sandy silt


A-6B: Ohio DOT: A-6b, silty clay


A-7-5: Ohio DOT: A-7-5, elastic clay


A-7-6: Ohio DOT: A-7-6, clay


PAVEMENT OR BASE: Ohio DOT: Pavement or Aggregate base


UNCONTROLLED FILL: Ohio DOT: Uncontrolled Fill

SAMPLER SYMBOLS

WELL CONSTRUCTION SYMBOLS


Soil Cuttings Backfill mixed with Bentonite Pellets or Chips


Asphalt or Concrete Pavement Patch

Notes:

1. Exploratory test borings were drilled during the period of July, 13 through 26., utilizing 2¼-inch hollow-stem augers and 3-inch solid stem augers.

2. These logs are subject to the limitations, conclusions, and recommendations in the report and should not be interpreted separate from the report.

3. Stationing and offsets at the boring locations were not available at the time of this report submittal. Latitude, Longitude, and ground surface elevations were surveyed by TTL via a handheld GPS. The accuracy from the handheld GPS device was generally found to be approximately 2 to 20 inches horizontal, and approximately 4 to 40 inches vertical.

SUMMARY OF SOIL TEST DATA
HEN-109-06.00, PID 95741 (SOUTH SEGMENT)

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-001-0-22	1.0 - 2.0	SS-1A	9	83	2.50	1	5	23	26	45	50	31	19	23	A-7-5 (13)	310
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.254106	2.5 - 4.0	SS-2	7	67	2.75	0	3	13	28	56	45	21	24	26	A-7-6 (15)	-
LONGITUDE = -84.036508	4.0 - 5.5	SS-3	5	44	2.25	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	4	89	1.50	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	17	100	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-002-0-22	1.0 - 2.0	SS-1A	8	89	4.50	7	6	13	29	45	39	23	16	20	A-6b (10)	-
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.255177	2.5 - 4.0	SS-2	7	78	2.00	2	3	12	31	52	46	24	22	25	A-7-6 (14)	300
LONGITUDE = -84.036499	4.0 - 5.5	SS-3	5	83	1.00	-	-	-	-	-	-	-	-	26	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	10	78	1.00	-	-	-	-	-	-	-	-	29	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	21	89	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-003-0-22	1.0 - 2.5	SS-1	9	83	4.25	4	7	17	28	44	42	25	17	20	A-7-6 (11)	310
STA. TBD	2.5 - 4.0	SS-2	8	78	2.25	-	-	-	-	-	-	-	-	25	A-7-6 (VISUAL)	-
LATITUDE = 41.256282	4.0 - 5.5	SS-3	10	83	3.00	8	4	17	24	47	45	24	21	28	A-7-6 (13)	-
LONGITUDE = -84.036564	5.5 - 7.0	SS-4	12	83	2.50	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	20	100	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-004-0-22	1.0 - 2.0	SS-1A	12	83	4.50	4	4	13	28	51	38	21	17	18	A-6b (11)	-
STA. TBD	2.0 - 2.5	SS-1B	-	-	-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.257356	2.5 - 4.0	SS-2	12	72	3.50	2	3	13	27	55	46	23	23	24	A-7-6 (14)	300
LONGITUDE = -84.036529	4.0 - 5.5	SS-3	7	83	2.50	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	9	78	4.50	-	-	-	-	-	-	-	-	19	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	17	94	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-005-0-22	1.0 - 2.5	SS-1	10	83	3.00	11	5	16	25	43	44	22	22	22	A-7-6 (12)	300
STA. TBD	2.5 - 4.0	SS-2	12	94	3.75	1	3	15	28	53	46	23	23	20	A-7-6 (14)	-
LATITUDE = 41.258427	4.0 - 5.5	SS-3	16	72	2.75	-	-	-	-	-	-	-	-	19	A-7-6 (VISUAL)	-
LONGITUDE = -84.036598	5.5 - 7.0	SS-4	12	94	4.25	-	-	-	-	-	-	-	-	17	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	22	89	4.50	-	-	-	-	-	-	-	-	15	A-7-6 (VISUAL)	-
B-006-0-22	1.0 - 2.5	SS-1	9	78	2.75	3	4	14	27	52	44	22	22	21	A-7-6 (14)	310
STA. TBD	2.5 - 4.0	SS-2	10	83	2.50	-	-	-	-	-	-	-	-	24	A-7-6 (VISUAL)	-
LATITUDE = 41.259529	4.0 - 5.5	SS-3	10	78	3.00	2	2	14	26	56	43	22	21	25	A-7-6 (13)	-
LONGITUDE = -84.036566	5.5 - 7.0	SS-4	8	89	1.00	-	-	-	-	-	-	-	-	26	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	17	100	4.50	-	-	-	-	-	-	-	-	17	A-6b (VISUAL)	-
B-007-0-22	1.0 - 2.5	SS-1	9	78	3.00	4	4	12	24	56	47	23	24	21	A-7-6 (15)	310
STA. TBD	2.5 - 4.0	SS-2	9	89	4.00	-	-	-	-	-	-	-	-	20	A-7-6 (VISUAL)	-
LATITUDE = 41.260630	4.0 - 5.5	SS-3	18	78	4.50	5	4	12	20	59	38	22	16	17	A-6b (10)	-
LONGITUDE = -84.036630	5.5 - 7.0	SS-4	21	89	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	25	100	4.50	-	-	-	-	-	-	-	-	14	A-6b (VISUAL)	-
B-008-0-22	1.0 - 2.5	SS-1	10	33	-	-	-	-	-	-	-	-	-	20	A-6b (VISUAL)	-
STA. TBD	2.5 - 4.0	SS-2	9	72	2.50	6	9	17	22	46	39	23	16	24	A-6b (9)	300
LATITUDE = 41.261702	4.0 - 5.5	SS-3	7	67	1.00	0	6	17	21	56	42	23	19	31	A-7-6 (12)	-
LONGITUDE = -84.036596	5.5 - 7.0	SS-4	10	89	3.25	-	-	-	-	-	-	-	-	18	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	9	94	4.5+	-	-	-	-	-	-	-	-	29	A-7-6 (VISUAL)	-
B-009-0-22	1.0 - 2.0	SS-1A	10	89	1.75	7	9	18	21	45	37	19	18	19	A-6b (9)	300
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.262808	2.5 - 4.0	SS-2	10	89	1.00	2	4	14	28	52	41	21	20	22	A-7-6 (12)	-
LONGITUDE = -84.036664	4.0 - 5.5	SS-3	8	89	2.50	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	14	83	4.50	-	-	-	-	-	-	-	-	17	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	16	89	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-010-0-22	1.0 - 2.5	SS-1	12	83	1.75	3	5	19	24	49	42	21	21	20	A-7-6 (12)	-
STA. TBD	2.5 - 4.0	SS-2	8	72	3.00	6	3	14	27	50	43	22	21	21	A-7-6 (13)	300
LATITUDE = 41.263917	4.0 - 5.5	SS-3	9	83	4.50	-	-	-	-	-	-	-	-	17	A-6b (VISUAL)	-
LONGITUDE = -84.036647	5.5 - 7.0	SS-4	20	72	3.75	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	23	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-011-0-22	1.0 - 2.5	SS-1	10	67	4.50	6	4	20	25	45	39	20	19	19	A-6b (11)	300
STA. TBD	2.5 - 4.0	SS-2	8	78	3.50	2	4	19	23	52	39	19	20	20	A-6b (12)	-
LATITUDE = 41.265000	4.0 - 5.5	SS-3	5	83	1.50	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
LONGITUDE = -84.036702	5.5 - 7.0	SS-4	17	72	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	20	89	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-012-0-22	1.0 - 2.5	SS-1	9	89	4.25	6	5	16	26	47	43	21	22	21	A-7-6 (13)	-
STA. TBD	2.5 - 4.0	SS-2	9	72	2.50	1	5	15	26	53	44	22	22	25	A-7-6 (14)	310
LATITUDE = 41.266116	4.0 - 5.5	SS-3	8	67	4.00	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
LONGITUDE = -84.036680	5.5 - 7.0	SS-4	8	83	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	21	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-013-0-22	1.0 - 2.5	SS-1	8	44	3.50	2	3	17	27	51	44	21	23	26	A-7-6 (14)	310
STA. TBD	2.5 - 4.0	SS-2	8	78	2.75	2	5	15	27	51	43	22	21	24	A-7-6 (13)	-
LATITUDE = 41.267215	4.0 - 5.5	SS-3	5	72	2.00	-	-	-	-	-	-	-	-	26	A-7-6 (VISUAL)	-
LONGITUDE = -84.036734	5.5 - 7.0	SS-4	7	83	0.50	-	-	-	-	-	-	-	-	24	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	20	94	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-014-0-22	1.0 - 2.0	SS-1A	9	83	4.25	1	5	18	28	48	39	20	19	21	A-6b (12)	-
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.268294	2.5 - 4.0	SS-2	8	89	2.50	1	4	16	26	53	41	21	20	28	A-7-6 (12)	300
LONGITUDE = -84.036717	4.0 - 5.5	SS-3	8	72	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	9	78	0.75	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	18	67	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-015-0-22	1.0 - 2.5	SS-1	12	78	3.50	9	9	11	20	51	47	25	22	24	A-7-6 (13)	250
STA. TBD	2.5 - 4.0	SS-2	9	72	2.75	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
LATITUDE = 41.269388	4.0 - 5.5	SS-3	10	44	2.00	1	4	11	23	61	42	20	22	29	A-7-6 (13)	-
LONGITUDE = -84.036767	5.5 - 7.0	SS-4	5	83	0.50	-	-	-	-	-	-	-	-	32	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	7	89	0.50	-	-	-	-	-	-	-	-	28	A-7-6 (VISUAL)	-
B-016-0-22	1.0 - 2.5	SS-1	9	33	3.75	1	5	11	22	61	47	25	22	23	A-7-6 (14)	260
STA. TBD	2.5 - 4.0	SS-2	8	83	3.00	1	6	17	26	50	48	25	23	24	A-7-6 (15)	-
LATITUDE = 41.270465	4.0 - 5.5	SS-3	7	39	3.00	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
LONGITUDE = -84.036741	5.5 - 7.0	SS-4	7	72	2.00	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	16	78	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-017-0-22	1.0 - 2.5	SS-1	8	67	3.75	1	5	23	26	45	48	25	23	27	A-7-6 (14)	-
STA. TBD	2.5 - 4.0	SS-2	12	78	4.00	0	4	19	24	53	46	23	23	23	A-7-6 (14)	260
LATITUDE = 41.271554	4.0 - 5.5	SS-3	9	56	3.25	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
LONGITUDE = -84.036809	5.5 - 7.0	SS-4	17	44	4.50	-	-	-	-	-	-	-	-	11	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	22	50	4.50	-	-	-	-	-	-	-	-	12	A-6b (VISUAL)	-
B-018-0-22	1.0 - 2.0	SS-1A	12	33	-	10	35	19	30	6	NP	NP	NP	16	A-4a (0)	<100
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.272641	2.5 - 4.0	SS-2	8	17	4.50	12	12	13	44	19	47	23	24	17	A-7-6 (12)	-
LONGITUDE = -84.036765	4.0 - 5.5	SS-3	9	50	3.00	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	9	83	3.75	-	-	-	-	-	-	-	-	18	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	20	100	4.50	-	-	-	-	-	-	-	-	13	A-6b (VISUAL)	-
B-019-0-22	1.0 - 2.0	SS-1A	9	17	2.50	39	10	10	31	10	37	19	18	14	A-6b (3)	-
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.273746	2.5 - 4.0	SS-2	7	39	2.75	8	7	10	26	49	42	21	21	23	A-7-6 (13)	260
LONGITUDE = -84.036829	4.0 - 5.5	SS-3	9	44	1.75	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
	5.5 - 7.0	SS-4	5	56	3.00	-	-	-	-	-	-	-	-	20	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	17	100	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-020-0-22	1.0 - 2.5	SS-1	12	50	1.50	17	7	10	24	42	42	22	20	21	A-7-6 (11)	260
STA. TBD	2.5 - 4.0	SS-2	14	61	3.00	7	6	11	21	55	43	22	21	19	A-7-6 (13)	-
LATITUDE = 41.274881	4.0 - 5.5	SS-3	8	67	2.00	-	-	-	-	-	-	-	-	20	A-6b (VISUAL)	-
LONGITUDE = -84.036778	5.5 - 7.0	SS-4	12	78	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	21	78	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-021-0-22	1.0 - 2.0	SS-1A	9	44	4.50	35	12	6	18	29	36	16	20	18	A-6b (6)	260
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.275956	2.5 - 4.0	SS-2	13	83	2.00	1	5	13	23	58	43	20	23	23	A-7-6 (14)	-
LONGITUDE = -84.036870	4.0 - 5.5	SS-3	7	72	4.50	-	-	-	-	-	-	-	-	19	A-6b (VISUAL)	-
	5.5 - 7.0	SS-4	16	67	4.25	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	17	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-022-0-22	1.0 - 2.5	SS-1	12	67	4.50	-	-	-	-	-	-	-	-	14	A-6b (VISUAL)	-
STA. TBD	2.5 - 4.0	SS-2	10	67	4.50	19	12	13	19	37	37	20	17	13	A-6b (7)	270
LATITUDE = 41.277045	4.0 - 5.5	SS-3	8	67	2.75	1	3	15	20	61	44	22	22	22	A-7-6 (14)	-
LONGITUDE = -84.036822	5.5 - 7.0	SS-4	14	78	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	16	83	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
B-023-0-22	1.0 - 2.5	SS-1	10	33	3.50	36	7	6	20	31	41	20	21	18	A-7-6 (7)	-
STA. TBD	2.5 - 4.0	SS-2	9	72	3.00	6	6	6	19	63	43	21	22	24	A-7-6 (13)	290
LATITUDE = 41.278138	4.0 - 5.5	SS-3	7	72	4.50	-	-	-	-	-	-	-	-	19	A-6b (VISUAL)	-
LONGITUDE = -84.036900	5.5 - 7.0	SS-4	10	89	2.50	-	-	-	-	-	-	-	-	22	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	21	78	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-024-0-22	1.0 - 2.5	SS-1	14	44	2.50	25	7	8	17	43	41	20	21	23	A-7-6 (10)	290
STA. TBD	2.5 - 4.0	SS-2	9	67	2.50	6	3	18	22	51	45	23	22	19	A-7-6 (13)	-
LATITUDE = 41.279230	4.0 - 5.5	SS-3	10	83	4.50	-	-	-	-	-	-	-	-	13	A-7-6 (VISUAL)	-
LONGITUDE = -84.036861	5.5 - 7.0	SS-4	9	72	1.25	-	-	-	-	-	-	-	-	23	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	18	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-025-0-22	1.0 - 2.5	SS-1	9	78	3.50	27	15	13	23	22	41	20	21	17	A-7-6 (5)	-
STA. TBD	2.5 - 4.0	SS-2	8	83	3.25	2	4	18	29	47	44	22	22	22	A-7-6 (14)	300
LATITUDE = 41.280317	4.0 - 5.5	SS-3	8	72	2.75	-	-	-	-	-	-	-	-	26	A-7-6 (VISUAL)	-
LONGITUDE = -84.036952	5.5 - 7.0	SS-4	12	83	4.50	-	-	-	-	-	-	-	-	17	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	17	78	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-026-0-22	1.0 - 2.5	SS-1	12	67	3.75	4	7	18	27	44	45	23	22	26	A-7-6 (13)	280
STA. TBD	2.5 - 4.0	SS-2	9	67	2.25	1	6	20	28	45	44	22	22	27	A-7-6 (13)	-
LATITUDE = 41.281432	4.0 - 5.5	SS-3	10	78	3.25	-	-	-	-	-	-	-	-	20	A-7-6 (VISUAL)	-
LONGITUDE = -84.036928	5.5 - 7.0	SS-4	16	83	4.50	-	-	-	-	-	-	-	-	18	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	18	67	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-027-0-22	1.0 - 2.5	SS-1	8	33	2.75	2	5	17	26	50	47	21	26	23	A-7-6 (16)	280
STA. TBD	2.5 - 4.0	SS-2	13	22	3.50	39	15	7	30	9	41	20	21	15	A-7-6 (3)	-
LATITUDE = 41.282511	4.0 - 5.5	SS-3	16	67	2.75	-	-	-	-	-	-	-	-	25	A-7-6 (VISUAL)	-
LONGITUDE = -84.036988	5.5 - 7.0	SS-4	5	78	1.50	-	-	-	-	-	-	-	-	31	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	25	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-028-0-22	1.0 - 2.5	SS-1	10	67	0.75	36	8	8	19	29	42	21	21	17	A-7-6 (6)	290
STA. TBD	2.5 - 4.0	SS-2	10	67	4.50	2	3	20	28	47	43	21	22	18	A-7-6 (13)	-
LATITUDE = 41.283626	4.0 - 5.5	SS-3	9	83	2.25	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
LONGITUDE = -84.036964	5.5 - 7.0	SS-4	14	89	4.50	-	-	-	-	-	-	-	-	17	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	14	94	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-029-0-22	1.0 - 2.0	SS-1A	9	22	-	-	-	-	-	-	-	-	-	5	UCF (VISUAL)	-
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-7-6 (VISUAL)	-
LATITUDE = 41.284698	2.5 - 4.0	SS-2	9	50	3.50	6	3	18	25	48	44	22	22	21	A-7-6 (13)	290
LONGITUDE = -84.037023	4.0 - 5.5	SS-3	7	50	3.75	2	4	16	26	52	44	23	21	21	A-7-6 (13)	-
	5.5 - 7.0	SS-4	9	78	1.50	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	14	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-030-0-22	1.0 - 2.5	SS-1	9	67	4.25	4	5	16	26	49	42	20	22	21	A-7-6 (13)	300
STA. TBD	2.5 - 4.0	SS-2	10	83	3.50	3	4	13	23	57	43	21	22	21	A-7-6 (13)	-
LATITUDE = 41.285822	4.0 - 5.5	SS-3	10	50	3.00	-	-	-	-	-	-	-	-	19	A-6b (VISUAL)	-
LONGITUDE = -84.037006	5.5 - 7.0	SS-4	7	78	1.25	-	-	-	-	-	-	-	-	21	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	22	83	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-
B-031-0-22	1.0 - 2.5	SS-1	10	44	2.25	1	3	14	21	61	41	20	21	22	A-7-6 (13)	310
STA. TBD	2.5 - 4.0	SS-2	10	78	3.25	1	3	14	24	58	42	20	22	20	A-7-6 (13)	-
LATITUDE = 41.286895	4.0 - 5.5	SS-3	13	72	2.50	-	-	-	-	-	-	-	-	20	A-7-6 (VISUAL)	-
LONGITUDE = -84.037074	5.5 - 7.0	SS-4	14	72	4.50	-	-	-	-	-	-	-	-	18	A-6b (VISUAL)	-
	7.0 - 8.5	SS-5	18	83	4.50	-	-	-	-	-	-	-	-	15	A-6b (VISUAL)	-
B-032-0-22	1.0 - 2.5	SS-1	12	22	2.25	3	6	14	22	55	45	22	23	19	A-7-6 (14)	300
STA. TBD	2.5 - 4.0	SS-2	10	67	3.50	1	2	9	20	68	44	21	23	21	A-7-6 (14)	-
LATITUDE = 41.287978	4.0 - 5.5	SS-3	13	83	4.25	-	-	-	-	-	-	-	-	19	A-6b (VISUAL)	-
LONGITUDE = -84.037046	5.5 - 7.0	SS-4	10	78	0.50	-	-	-	-	-	-	-	-	27	A-7-6 (VISUAL)	-
	7.0 - 8.5	SS-5	16	78	4.50	-	-	-	-	-	-	-	-	16	A-6b (VISUAL)	-

SUMMARY OF SOIL TEST DATA
HEN-109-06.00, PID 95741 (NORTH SEGMENT)

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-033-0-22	1.5 - 2.0	SS-1A	14	100	-	-	-	-	-	-	-	-	-	-	A-3a (VISUAL)	-
STA. TBD	2.0 - 3.0	SS-1B			-	2.00	6	63	27	2	NP	NP	NP	24	A-3a (0)	<100
LATITUDE = 41.450534	3.0 - 4.5	SS-2	8	100	-	1.00	4	66	27	2	NP	NP	NP	20	A-3a (0)	-
LONGITUDE = -84.008817	4.5 - 6.0	SS-3	10	100	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-
	6.0 - 7.5	SS-4	12	100	-	-	-	-	-	-	-	-	-	22	A-3a (VISUAL)	-
	7.5 - 9.0	SS-5	13	100	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
B-034-0-22	2.0 - 3.5	SS-1	13	100	-	1.00	5	67	25	2	NP	NP	NP	14	A-3a (0)	<100
STA. TBD	3.5 - 5.0	SS-2	9	100	-	0.00	4	64	30	2	NP	NP	NP	19	A-3a (0)	-
LATITUDE = 41.451578	5.0 - 6.5	SS-3	7	100	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
LONGITUDE = -84.008760	6.5 - 8.0	SS-4	8	100	-	-	-	-	-	-	-	-	-	26	A-3a (VISUAL)	-
	8.0 - 9.5	SS-5	13	100	-	-	-	-	-	-	-	-	-	28	A-3a (VISUAL)	-
B-035-0-22	1.5 - 3.0	SS-1	22	67	-	2.00	3	70	23	2	NP	NP	NP	10	A-3a (0)	-
STA. TBD	3.0 - 4.5	SS-2	14	78	-	1.00	3	73	21	2	NP	NP	NP	18	A-3a (0)	<100
LATITUDE = 41.452683	4.5 - 6.0	SS-3	12	67	-	-	-	-	-	-	-	-	-	19	A-3 (VISUAL)	-
LONGITUDE = -84.008802	6.0 - 7.5	SS-4	13	89	-	-	-	-	-	-	-	-	-	21	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	13	78	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
B-036-0-22	1.4 - 2.9	SS-1	22	50	-	12.00	4	62	20	2	NP	NP	NP	13	A-3a (0)	<100
STA. TBD	2.9 - 4.4	SS-2	10	56	-	1.00	2	80	15	2	NP	NP	NP	19	A-3a (0)	-
LATITUDE = 41.453769	4.4 - 5.9	SS-3	7	61	-	-	-	-	-	-	-	-	-	16	A-3a (VISUAL)	-
LONGITUDE = -84.008746	5.9 - 7.4	SS-4	13	56	-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
	7.4 - 8.9	SS-5	12	50	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-037-0-22	1.7 - 3.2	SS-1	23	67	-	1.00	2	75	20	2	NP	NP	NP	17	A-3a (0)	<100
STA. TBD	3.2 - 4.7	SS-2	16	61	-	0.00	1	78	19	2	NP	NP	NP	19	A-3a (0)	-
LATITUDE = 41.454846	4.7 - 6.2	SS-3	18	56	-	-	-	-	-	-	-	-	-	23	A-3a (VISUAL)	-
LONGITUDE = -84.008814	6.2 - 7.7	SS-4	14	50	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
	7.7 - 9.2	SS-5	9	44	-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
B-038-0-22	1.7 - 3.2	SS-1	9	67	-	2.00	3	78	15	2	NP	NP	NP	21	A-3a (0)	-
STA. TBD	3.2 - 4.7	SS-2	9	78	-	0.00	8	69	21	2	NP	NP	NP	20	A-3a (0)	<100
LATITUDE = 41.455932	4.7 - 6.2	SS-3	10	67	-	-	-	-	-	-	-	-	-	22	A-3a (VISUAL)	-
LONGITUDE = -84.008749	6.2 - 7.7	SS-4	16	67	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
	7.7 - 9.2	SS-5	12	72	-	-	-	-	-	-	-	-	-	25	A-3 (VISUAL)	-
B-039-0-22	1.2 - 2.7	SS-1	22	67	-	2.00	3	81	12	2	NP	NP	NP	16	A-3a (0)	<100
STA. TBD	2.7 - 4.2	SS-2	9	72	-	0.00	2	81	15	2	NP	NP	NP	19	A-3a (0)	-
LATITUDE = 41.457024	4.2 - 5.7	SS-3	18	89	-	-	-	-	-	-	-	-	-	20	A-3 (VISUAL)	-
LONGITUDE = -84.008803	5.7 - 7.2	SS-4	13	72	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
	7.2 - 8.7	SS-5	14	78	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
B-040-0-22	1.2 - 2.7	SS-1	16	78	-	1.00	3	76	18	2	NP	NP	NP	16	A-3a (0)	140
STA. TBD	2.7 - 4.2	SS-2	8	83	-	0.00	2	74	22	2	NP	NP	NP	18	A-3a (0)	-
LATITUDE = 41.458139	4.2 - 5.7	SS-3	8	78	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
LONGITUDE = -84.008750	5.7 - 7.2	SS-4	25	78	-	-	-	-	-	-	-	-	-	23	A-3a (VISUAL)	-
	7.2 - 8.7	SS-5	17	83	-	-	-	-	-	-	-	-	-	23	A-3a (VISUAL)	-
B-041-0-22	1.3 - 2.8	SS-1	18	83	-	1.00	2	79	16	2	NP	NP	NP	10	A-3a (0)	130
STA. TBD	2.8 - 4.3	SS-2	8	72	-	1.00	3	76	18	2	NP	NP	NP	18	A-3a (0)	-
LATITUDE = 41.459253	4.3 - 5.0	SS-3A	16	78	-	-	-	-	-	-	-	-	-	-	A-3a (VISUAL)	-
LONGITUDE = -84.008803	5.0 - 5.8	SS-3B			-	-	-	-	-	-	-	-	-	20	A-3 (VISUAL)	-
	5.8 - 7.3	SS-4	21	72	-	-	-	-	-	-	-	-	-	18	A-3 (VISUAL)	-
	7.3 - 8.8	SS-5	20	72	-	-	-	-	-	-	-	-	-	22	A-3a (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-042-0-22	1.2 - 2.7	SS-1	20	67	-	3.00	3	77	15	2	NP	NP	NP	12	A-3a (0)	130
STA. TBD	2.7 - 4.2	SS-2	9	78	-	0.00	7	60	31	2	NP	NP	NP	19	A-3a (0)	-
LATITUDE = 41.460344	4.2 - 5.7	SS-3	4	83	0.75	-	-	-	-	-	-	-	-	27	A-6b (VISUAL)	-
LONGITUDE = -84.008742	5.7 - 7.2	SS-4	17	89	-	-	-	-	-	-	-	-	-	22	A-3a (VISUAL)	-
	7.2 - 8.7	SS-5	18	72	-	-	-	-	-	-	-	-	-	25	A-3a (VISUAL)	-
B-043-0-22	1.2 - 2.7	SS-1	18	78	-	10.00	4	58	26	2	NP	NP	NP	16	A-3a (0)	<100
STA. TBD	2.7 - 4.2	SS-2	10	83	-	0.00	2	65	31	2	NP	NP	NP	18	A-3a (0)	-
LATITUDE = 41.461421	4.2 - 5.7	SS-3	8	72	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
LONGITUDE = -84.008796	5.7 - 7.2	SS-4	23	83	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
	7.2 - 8.7	SS-5	14	78	-	-	-	-	-	-	-	-	-	23	A-3a (VISUAL)	-
B-044-0-22	1.3 - 2.8	SS-1	8	72	-	1.00	2	68	27	2	NP	NP	NP	15	A-3a (0)	-
STA. TBD	2.8 - 4.3	SS-2	5	83	-	1.00	3	61	32	3	NP	NP	NP	19	A-3a (0)	<100
LATITUDE = 41.462537	4.3 - 5.8	SS-3	4	83	-	-	-	-	-	-	-	-	-	18	A-3a (VISUAL)	-
LONGITUDE = -84.008731	5.8 - 7.3	SS-4	17	72	-	-	-	-	-	-	-	-	-	25	A-3 (VISUAL)	-
	7.3 - 8.8	SS-5	14	78	-	-	-	-	-	-	-	-	-	27	A-3 (VISUAL)	-
B-045-0-22	1.3 - 2.8	SS-1	20	67	-	6.00	5	57	30	2	NP	NP	NP	19	A-3a (0)	<100
STA. TBD	2.8 - 4.3	SS-2	7	83	-	3.00	2	41	35	19	19	16	3	17	A-4a (4)	-
LATITUDE = 41.463641	4.3 - 4.8	SS-3A	5	89	-	-	-	-	-	-	-	-	-	-	A-4a (VISUAL)	-
LONGITUDE = -84.008792	4.8 - 5.8	SS-3B			1.75	-	-	-	-	-	-	-	-	25	A-6b (VISUAL)	-
	5.8 - 6.6	SS-4A	16	72	-	-	-	-	-	-	-	-	-	-	A-6b (VISUAL)	-
	6.6 - 7.3	SS-4B			-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
	7.3 - 8.8	SS-5	14	67	-	-	-	-	-	-	-	-	-	28	A-3 (VISUAL)	-
B-046-0-22	1.0 - 2.0	SS-1A	13	78	-	0.00	3	61	32	4	NP	NP	NP	16	A-4a (0)	<100
STA. TBD	2.0 - 2.5	SS-1B			-	-	-	-	-	-	-	-	-	-	A-3a (VISUAL)	-
LATITUDE = 41.464741	2.5 - 4.0	SS-2	10	83	-	0.00	1	77	20	2	NP	NP	NP	20	A-3a (0)	-
LONGITUDE = -84.008729	4.0 - 5.0	SS-3A	13	72	-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
	5.0 - 5.5	SS-3B			-	-	-	-	-	-	-	-	-	-	A-3 (VISUAL)	-
	5.5 - 7.0	SS-4	25	78	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
	7.0 - 8.5	SS-5	16	67	-	-	-	-	-	-	-	-	-	27	A-3 (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-047-0-22	1.5 - 3.0	SS-1	7	83	-	1.00	7	64	26	2	NP	NP	NP	21	A-3a (0)	-
STA. TBD	3.0 - 4.5	SS-2	5	83	2	0.00	9	49	37	5	-	-	-	24	A-4a (VISUAL)	120
LATITUDE = 41.465797	4.5 - 6.0	SS-3	8	72	-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
LONGITUDE = -84.008782	6.0 - 7.5	SS-4	7	67	-	-	-	-	-	-	-	-	-	27	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	13	67	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
B-048-0-22	1.5 - 3.0	SS-1	12	78	-	1.00	4	62	31	2	NP	NP	NP	21	A-3a (0)	<100
STA. TBD	3.0 - 4.5	SS-2	9	72	-	1.00	6	59	31	3	NP	NP	NP	20	A-3a (0)	-
LATITUDE = 41.466920	4.5 - 6.0	SS-3	5	83	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
LONGITUDE = -84.008712	6.0 - 7.5	SS-4	17	72	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	18	67	-	-	-	-	-	-	-	-	-	27	A-3 (VISUAL)	-
B-049-0-22	1.5 - 3.0	SS-1	9	72	-	1.00	25	45	27	2	NP	NP	NP	29	A-3a (0)	<100
STA. TBD	3.0 - 4.5	SS-2	9	83	-	0.00	4	68	26	2	NP	NP	NP	16	A-3a (0)	-
LATITUDE = 41.467915	4.5 - 6.0	SS-3	12	67	-	-	-	-	-	-	-	-	-	15	A-3 (VISUAL)	-
LONGITUDE = -84.008785	6.0 - 7.5	SS-4	13	78	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	20	67	-	-	-	-	-	-	-	-	-	28	A-3 (VISUAL)	-
B-050-0-22	1.5 - 3.0	SS-1	14	78	-	0.00	7	70	21	2	NP	NP	NP	9	A-3a (0)	150
STA. TBD	3.0 - 4.5	SS-2	9	83	-	0.00	4	62	32	2	NP	NP	NP	17	A-3a (0)	-
LATITUDE = 41.468940	4.5 - 6.0	SS-3	12	72	-	-	-	-	-	-	-	-	-	17	A-3a (VISUAL)	-
LONGITUDE = -84.008722	6.0 - 7.5	SS-4	10	78	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	14	67	-	-	-	-	-	-	-	-	-	24	A-3 (VISUAL)	-
B-051-0-22	1.4 - 2.9	SS-1	10	78	-	0.00	4	77	17	2	NP	NP	NP	11	A-3a (0)	<100
STA. TBD	2.9 - 4.4	SS-2	7	72	-	0.00	2	73	23	2	NP	NP	NP	15	A-3a (0)	-
LATITUDE = 41.470035	4.4 - 5.9	SS-3	7	83	-	-	-	-	-	-	-	-	-	17	A-3a (VISUAL)	-
LONGITUDE = -84.008782	5.9 - 7.4	SS-4	13	72	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-
	7.4 - 8.9	SS-5	10	89	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-052-0-22	1.5 - 3.0	SS-1	12	67	-	1.00	5	79	13	2	NP	NP	NP	11	A-3a (0)	<100
STA. TBD	3.0 - 4.5	SS-2	5	72	-	0.00	2	66	30	2	NP	NP	NP	18	A-3a (0)	-
LATITUDE = 41.471103	4.5 - 6.0	SS-3	10	78	-	-	-	-	-	-	-	-	-	19	A-3 (VISUAL)	-
LONGITUDE = -84.008695	6.0 - 7.5	SS-4	10	72	-	-	-	-	-	-	-	-	-	28	A-3 (VISUAL)	-
	7.5 - 9.0	SS-5	9	83	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-
B-053-0-22	1.5 - 3.0	SS-1	17	67	-	2.00	3	86	7	2	NP	NP	NP	13	A-3 (0)	110
STA. TBD	3.0 - 4.5	SS-2	9	83	-	0.00	1	89	8	2	NP	NP	NP	17	A-3 (0)	-
LATITUDE = 41.472051	4.5 - 6.0	SS-3	7	89	-	-	-	-	-	-	-	-	-	23	A-3a (VISUAL)	-
LONGITUDE = -84.008776	6.0 - 7.5	SS-4	10	67	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
	7.5 - 9.0	SS-5	10	78	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
B-054-0-22	1.0 - 2.5	SS-1	16	44	-	-	-	-	-	-	-	-	-	4	UCF (VISUAL)	-
STA. TBD	2.5 - 4.0	SS-2	14	50	-	16.00	8	59	15	2	NP	NP	NP	12	A-3a (0)	110
LATITUDE = 41.473141	4.0 - 5.5	SS-3	16	72	-	0.00	3	88	7	2	NP	NP	NP	18	A-3 (0)	-
LONGITUDE = -84.008702	5.5 - 7.0	SS-4	16	39	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	26	50	-	-	-	-	-	-	-	-	-	21	A-3a (VISUAL)	-
B-055-0-22	1.0 - 2.5	SS-1	13	39	-	0.00	4	83	11	2	NP	NP	NP	18	A-3a (0)	<100
STA. TBD	2.5 - 4.0	SS-2	7	67	-	8.00	13	64	13	2	NP	NP	NP	13	A-3a (0)	-
LATITUDE = 41.474217	4.0 - 5.5	SS-3	7	78	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
LONGITUDE = -84.008769	5.5 - 7.0	SS-4	9	39	-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	14	67	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
B-056-0-22	1.0 - 2.5	SS-1	10	33	-	1.00	6	83	8	2	NP	NP	NP	6	A-3 (0)	<100
STA. TBD	2.5 - 4.0	SS-2	9	39	-	0.00	4	87	7	2	NP	NP	NP	6	A-3 (0)	-
LATITUDE = 41.475215	4.0 - 5.0	SS-3A	5	50	-	-	-	-	-	-	-	-	-	-	A-3 (VISUAL)	-
LONGITUDE = -84.008712	5.0 - 5.5	SS-3B			-	-	-	-	-	-	-	-	-	20	A-3a (VISUAL)	-
	5.5 - 7.0	SS-4	7	78	-	-	-	-	-	-	-	-	-	20	A-3 (VISUAL)	-
	7.0 - 8.5	SS-5	16	67	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-057-0-22	1.0 - 2.5	SS-1	17	17	-	1.00	12	58	26	3	NP	NP	NP	9	A-3a (0)	<100
STA. TBD	2.5 - 4.0	SS-2	8	39	-	1.00	3	75	19	2	NP	NP	NP	17	A-3a (0)	-
LATITUDE = 41.476270	4.0 - 5.5	SS-3	7	72	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
LONGITUDE = -84.008761	5.5 - 7.0	SS-4	10	44	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	17	100	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-
B-058-0-22	1.0 - 2.5	SS-1	17	44	-	1.00	5	82	10	2	NP	NP	NP	6	A-3a (0)	110
STA. TBD	2.5 - 4.0	SS-2	9	44	-	0.00	7	83	8	2	NP	NP	NP	9	A-3 (0)	-
LATITUDE = 41.477373	4.0 - 5.5	SS-3	9	39	-	-	-	-	-	-	-	-	-	11	A-3 (VISUAL)	-
LONGITUDE = -84.008686	5.5 - 7.0	SS-4	4	44	-	-	-	-	-	-	-	-	-	24	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	10	56	-	-	-	-	-	-	-	-	-	26	A-3a (VISUAL)	-
B-059-0-22	1.0 - 2.5	SS-1	13	39	-	3.00	4	72	19	2	NP	NP	NP	13	A-3a (0)	<100
STA. TBD	2.5 - 4.0	SS-2	7	36	-	-	-	-	-	-	-	-	-	14	A-3a (VISUAL)	-
LATITUDE = 41.478448	4.0 - 5.5	SS-3	7	67	-	1.00	3	72	22	2	NP	NP	NP	21	A-3a (0)	-
LONGITUDE = -84.008768	5.5 - 7.0	SS-4	10	39	-	-	-	-	-	-	-	-	-	26	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	14	78	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
B-060-0-22	1.0 - 2.5	SS-1	13	0	-	-	-	-	-	-	-	-	-	-	A-4a (VISUAL)	-
STA. TBD	2.5 - 4.0	SS-2	9	83	-	1.00	7	67	23	2	NP	NP	NP	20	A-3a (0)	<100
LATITUDE = 41.479557	4.0 - 5.5	SS-3	8	44	-	0.00	4	71	23	2	NP	NP	NP	20	A-3a (0)	-
LONGITUDE = -84.008709	5.5 - 7.0	SS-4	9	44	-	-	-	-	-	-	-	-	-	29	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	8	33	-	-	-	-	-	-	-	-	-	28	A-3 (VISUAL)	-
B-061-0-22	1.0 - 2.5	SS-1	9	22	-	4.00	17	45	31	3	NP	NP	NP	20	A-3a (0)	<100
STA. TBD	2.5 - 4.0	SS-2	8	56	-	1.00	1	68	28	2	NP	NP	NP	17	A-3a (0)	-
LATITUDE = 41.480500	4.0 - 5.5	SS-3	8	67	-	-	-	-	-	-	-	-	-	20	A-3 (VISUAL)	-
LONGITUDE = -84.008775	5.5 - 7.0	SS-4	14	44	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
	7.0 - 8.5	SS-5	20	50	-	-	-	-	-	-	-	-	-	21	A-3a (VISUAL)	-

EXPLORATION ID., STATION & OFFSET	FROM - TO	SAMPLE ID	N60	% REC	tsf HP	% GR	% CS	% FS	% SILT	% CLAY	LL	PL	PI	% WC	ODOT CLASS (GI)	ppm SO4
B-062-0-22	1.0 - 2.5	SS-1	14	44	-	1.00	8	71	18	2	NP	NP	NP	7	A-3a (0)	100
STA. TBD	2.5 - 4.0	SS-2	7	44	-	1.00	6	68	23	2	NP	NP	NP	21	A-3a (0)	-
LATITUDE = 41.481531	4.0 - 5.5	SS-3	5	44	-	-	-	-	-	-	-	-	-	12	A-3a (VISUAL)	-
LONGITUDE = -84.008704	5.5 - 7.0	SS-4	7	67	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
	7.0 - 8.5	SS-5	7	39	-	-	-	-	-	-	-	-	-	19	A-3a (VISUAL)	-
B-063-0-22	1.0 - 2.5	SS-1	16	33	-	3.00	7	65	23	2	NP	NP	NP	12	A-3a (0)	-
STA. TBD	2.5 - 4.0	SS-2	14	100	-	1.00	6	68	23	2	NP	NP	NP	17	A-3a (0)	120
LATITUDE = 41.482608	4.0 - 5.5	SS-3	10	100	-	-	-	-	-	-	-	-	-	15	A-3a (VISUAL)	-
LONGITUDE = -84.008774	5.5 - 7.0	SS-4	16	100	-	-	-	-	-	-	-	-	-	19	A-3 (VISUAL)	-
	7.0 - 8.5	SS-5	20	100	-	-	-	-	-	-	-	-	-	23	A-3 (VISUAL)	-
B-064-0-22	1.5 - 3.0	SS-1	27	89	-	0.00	5	86	7	2	NP	NP	NP	7	A-3 (0)	120
STA. TBD	3.0 - 4.5	SS-2	18	100	-	1.00	2	89	6	2	NP	NP	NP	8	A-3 (0)	-
LATITUDE = 41.483725	4.5 - 6.0	SS-3	14	100	-	-	-	-	-	-	-	-	-	10	A-3 (VISUAL)	-
LONGITUDE = -84.008710	6.0 - 7.5	SS-4	23	100	-	-	-	-	-	-	-	-	-	9	A-3 (VISUAL)	-
B-065-0-22	1.5 - 3.0	SS-1	38	94	-	3.00	4	81	10	2	NP	NP	NP	11	A-3a (0)	<100
STA. TBD	3.0 - 4.5	SS-2	20	94	-	1.00	6	66	25	2	NP	NP	NP	24	A-3a (0)	-
LATITUDE = 41.484801	4.5 - 6.0	SS-3	14	100	-	-	-	-	-	-	-	-	-	15	A-3 (VISUAL)	-
LONGITUDE = -84.008751	6.0 - 7.5	SS-4	29	100	-	-	-	-	-	-	-	-	-	15	A-3 (VISUAL)	-
B-066-0-22	1.5 - 3.0	SS-1	29	94	-	1.00	5	86	6	2	NP	NP	NP	5	A-3 (0)	130
STA. TBD	3.0 - 4.5	SS-2	20	100	-	0.00	4	89	5	2	NP	NP	NP	6	A-3 (0)	-
LATITUDE = 41.485645	4.5 - 6.0	SS-3	14	100	-	-	-	-	-	-	-	-	-	11	A-3 (VISUAL)	-
LONGITUDE = -84.008693	6.0 - 7.5	SS-4	15	100	-	-	-	-	-	-	-	-	-	16	A-3 (VISUAL)	-
B-067-0-22	1.0 - 2.5	SS-1	42	89	-	2.00	5	78	13	2	NP	NP	NP	7	A-3a (0)	140
STA. TBD	2.5 - 4.0	SS-2	29	100	-	0.00	3	90	5	2	NP	NP	NP	9	A-3 (0)	-
LATITUDE = 41.486487	4.0 - 5.5	SS-3	18	100	-	-	-	-	-	-	-	-	-	16	A-3 (VISUAL)	-
LONGITUDE = -84.008767	5.5 - 7.0	SS-4	14	100	-	-	-	-	-	-	-	-	-	22	A-3 (VISUAL)	-

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
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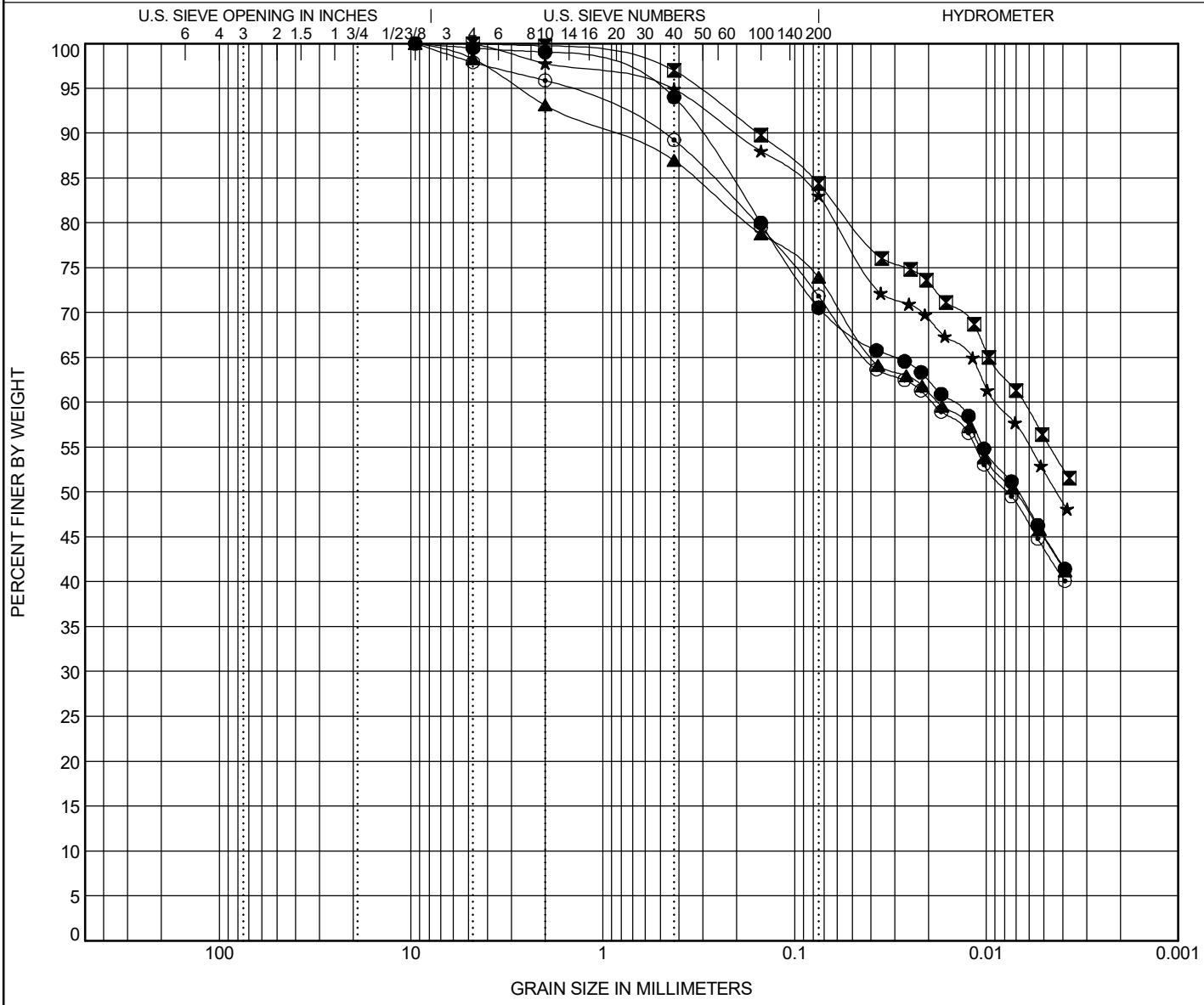
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-001-0-22	1.0	**A-7-5 ~ ELASTIC SILT with SAND(MH)**	**50**	**31**	**19**
⊠	B-001-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**45**	**21**	**24**
▲	B-002-0-22	1.0	**A-6b ~ LEAN CLAY with SAND(CL)**	**39**	**23**	**16**
★	B-002-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**46**	**24**	**22**
⊙	B-003-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**25**	**17**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-001-0-22	1.0	**0.315**	**0.007**			**1**	**5**	**23**	**26**	**45**		
⊠	B-001-0-22	2.5	**0.155**				**0**	**3**	**13**	**28**	**56**		
▲	B-002-0-22	1.0	**0.914**	**0.007**			**7**	**6**	**13**	**29**	**45**		
★	B-002-0-22	2.5	**0.203**	**0.004**			**2**	**3**	**12**	**31**	**52**		
⊙	B-003-0-22	1.0	**0.508**	**0.008**			**4**	**7**	**17**	**28**	**44**		

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GRAIN SIZE DISTRIBUTION

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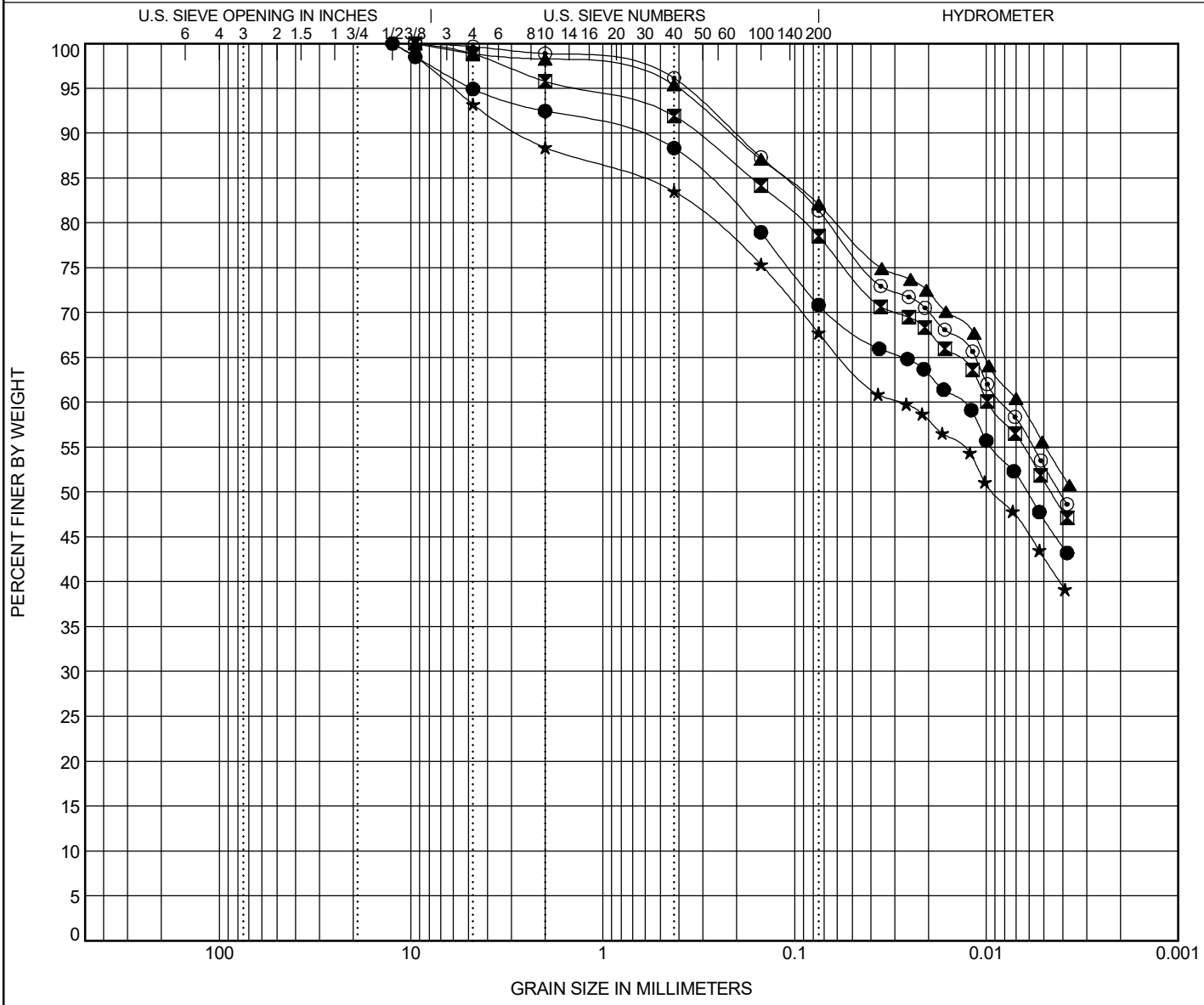
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-003-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**45**	**24**	**21**
⊠	B-004-0-22	1.0	**A-6b ~ LEAN CLAY with SAND(CL)**	**38**	**21**	**17**
▲	B-004-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**46**	**23**	**23**
★	B-005-0-22	1.0	**A-7-6 ~ SANDY LEAN CLAY(CL)**	**44**	**22**	**22**
⊙	B-005-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**46**	**23**	**23**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-003-0-22	4.0	**0.793**	**0.006**			**8**	**4**	**17**	**24**	**47**		
⊠	B-004-0-22	1.0	**0.328**	**0.005**			**4**	**4**	**13**	**28**	**51**		
▲	B-004-0-22	2.5	**0.216**				**2**	**3**	**13**	**27**	**55**		
★	B-005-0-22	1.0	**2.664**	**0.009**			**11**	**5**	**16**	**25**	**43**		
⊙	B-005-0-22	2.5	**0.206**	**0.004**			**1**	**3**	**15**	**28**	**53**		

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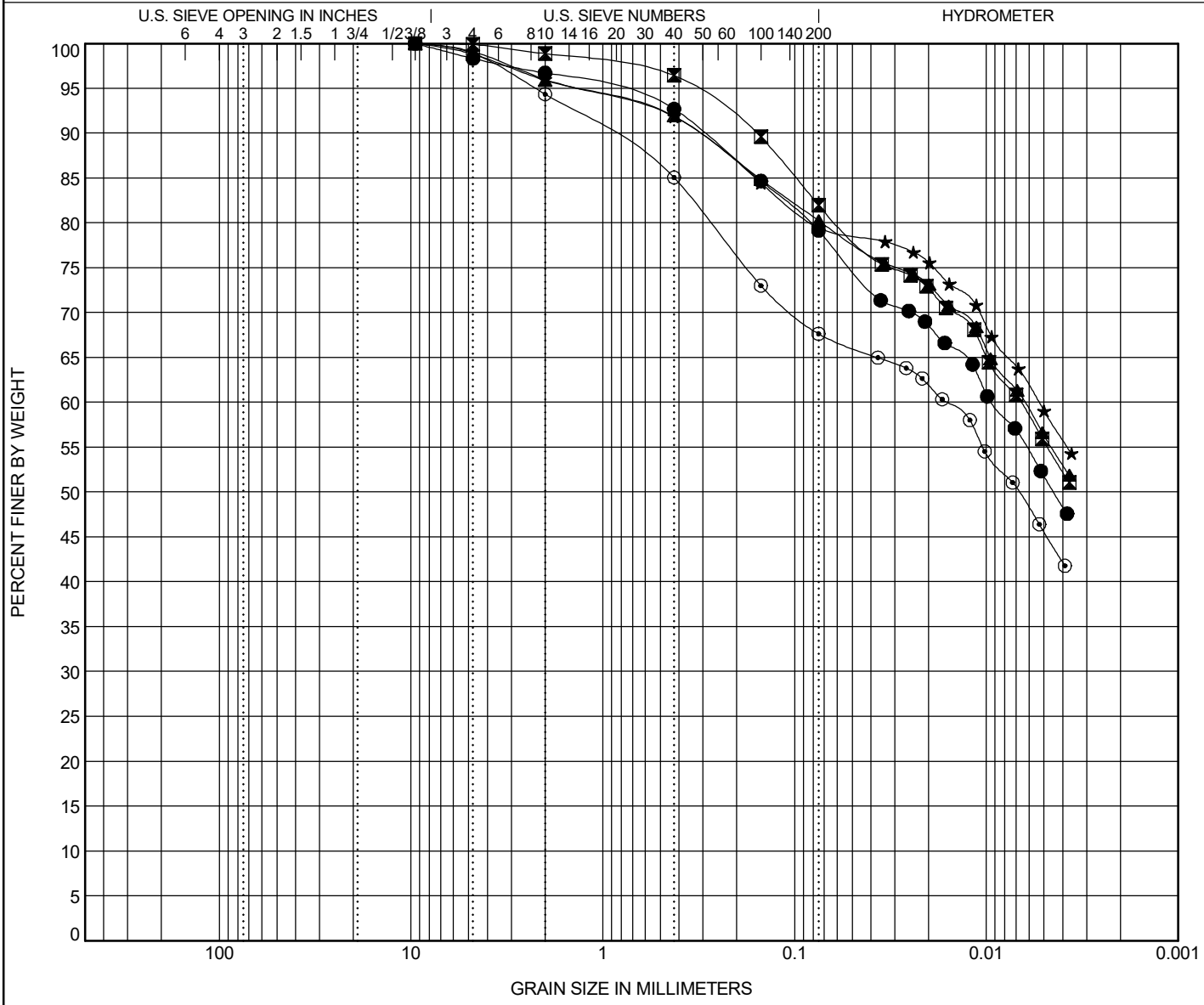
OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-006-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**
⊠	B-006-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**22**	**21**
▲	B-007-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**47**	**23**	**24**
★	B-007-0-22	4.0	**A-6b ~ LEAN CLAY with SAND(CL)**	**38**	**22**	**16**
⊙	B-008-0-22	2.5	**A-6b ~ SANDY LEAN CLAY(CL)**	**39**	**23**	**16**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-006-0-22	1.0	**0.3**	**0.004**			**3**	**4**	**14**	**27**	**52**		
⊠	B-006-0-22	4.0	**0.16**				**2**	**2**	**14**	**26**	**56**		
▲	B-007-0-22	1.0	**0.321**				**4**	**4**	**12**	**24**	**56**		
★	B-007-0-22	4.0	**0.327**				**5**	**4**	**12**	**20**	**59**		
⊙	B-008-0-22	2.5	**0.969**	**0.007**			**6**	**9**	**17**	**22**	**46**		

GRAIN SIZE DISTRIBUTION

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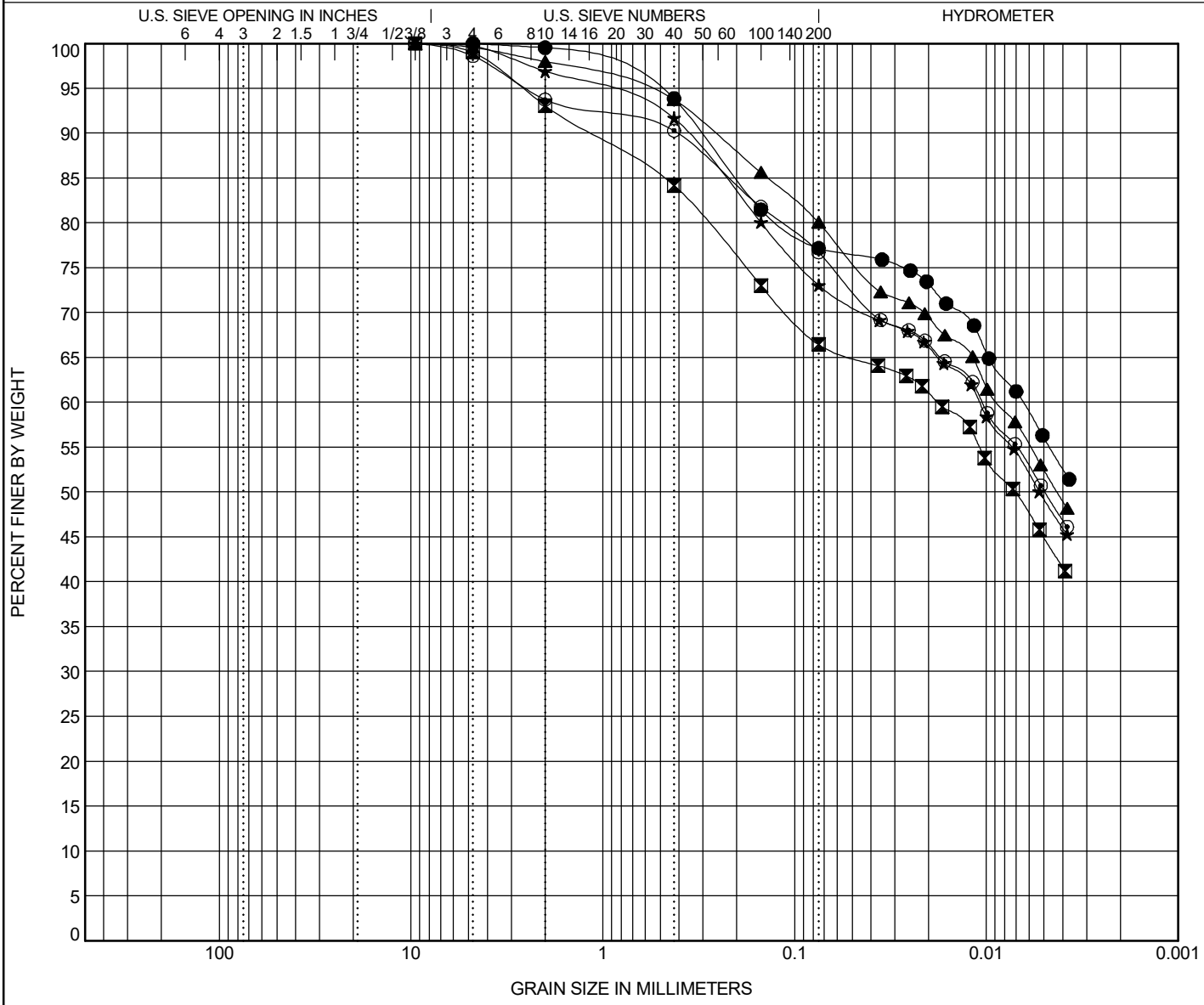
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-008-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**23**	**19**
⊠	B-009-0-22	1.0	**A-6b ~ SANDY LEAN CLAY(CL)**	**37**	**19**	**18**
▲	B-009-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**41**	**21**	**20**
★	B-010-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**21**	**21**
⊙	B-010-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**22**	**21**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-008-0-22	4.0	**0.307**				**0**	**6**	**17**	**21**	**56**		
⊠	B-009-0-22	1.0	**1.174**	**0.007**			**7**	**9**	**18**	**21**	**45**		
▲	B-009-0-22	2.5	**0.263**	**0.004**			**2**	**4**	**14**	**28**	**52**		
★	B-010-0-22	1.0	**0.366**	**0.005**			**3**	**5**	**19**	**24**	**49**		
⊙	B-010-0-22	2.5	**0.411**	**0.005**			**6**	**3**	**14**	**27**	**50**		

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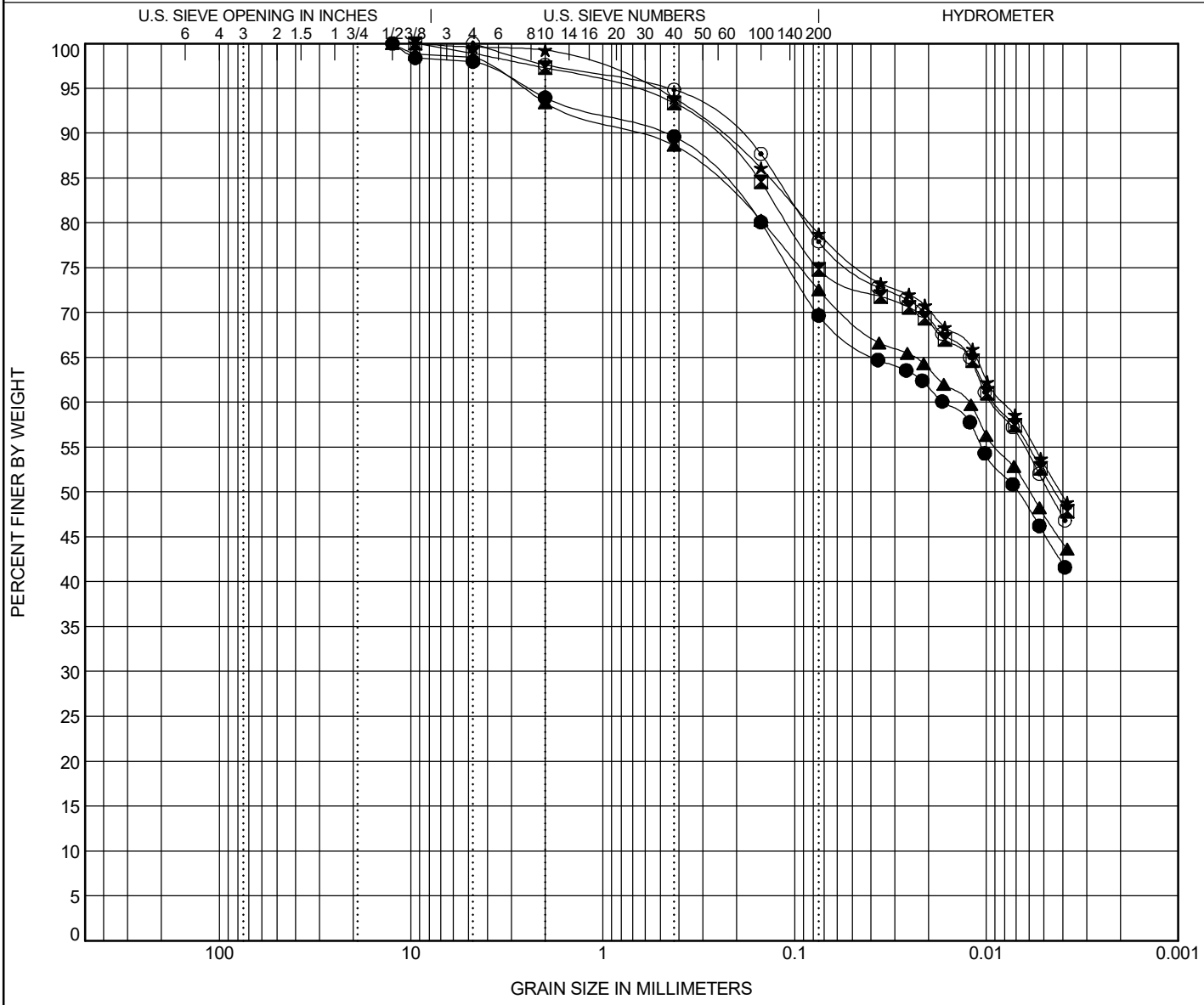
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-011-0-22	1.0	**A-6b ~ SANDY LEAN CLAY(CL)**	**39**	**20**	**19**
⊠	B-011-0-22	2.5	**A-6b ~ LEAN CLAY with SAND(CL)**	**39**	**19**	**20**
▲	B-012-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**21**	**22**
★	B-012-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**
⊙	B-013-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**21**	**23**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-011-0-22	1.0	**0.486**	**0.007**			**6**	**4**	**20**	**25**	**45**		
⊠	B-011-0-22	2.5	**0.285**	**0.004**			**2**	**4**	**19**	**23**	**52**		
▲	B-012-0-22	1.0	**0.662**	**0.006**			**6**	**5**	**16**	**26**	**47**		
★	B-012-0-22	2.5	**0.252**	**0.004**			**1**	**5**	**15**	**26**	**53**		
⊙	B-013-0-22	1.0	**0.21**	**0.005**			**2**	**3**	**17**	**27**	**51**		

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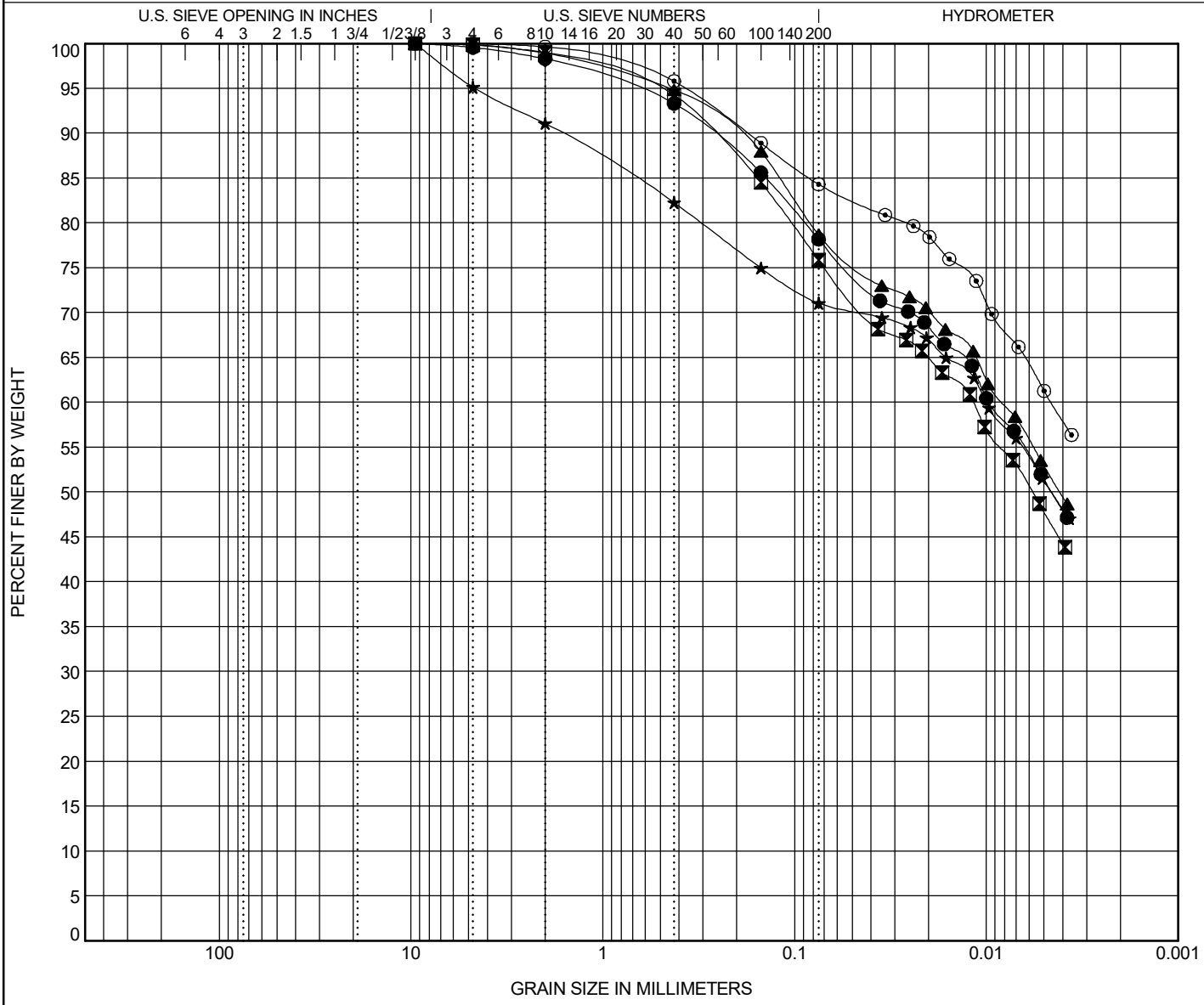
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-013-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**22**	**21**
⊠	B-014-0-22	1.0	**A-6b ~ LEAN CLAY with SAND(CL)**	**39**	**20**	**19**
▲	B-014-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**41**	**21**	**20**
★	B-015-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**47**	**25**	**22**
⊙	B-015-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**20**	**22**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-013-0-22	2.5	**0.272**	**0.005**			**2**	**5**	**15**	**27**	**51**		
⊠	B-014-0-22	1.0	**0.269**	**0.006**			**1**	**5**	**18**	**28**	**48**		
▲	B-014-0-22	2.5	**0.204**	**0.004**			**1**	**4**	**16**	**26**	**53**		
★	B-015-0-22	1.0	**1.652**	**0.005**			**9**	**9**	**11**	**20**	**51**		
⊙	B-015-0-22	4.0	**0.177**				**1**	**4**	**11**	**23**	**61**		

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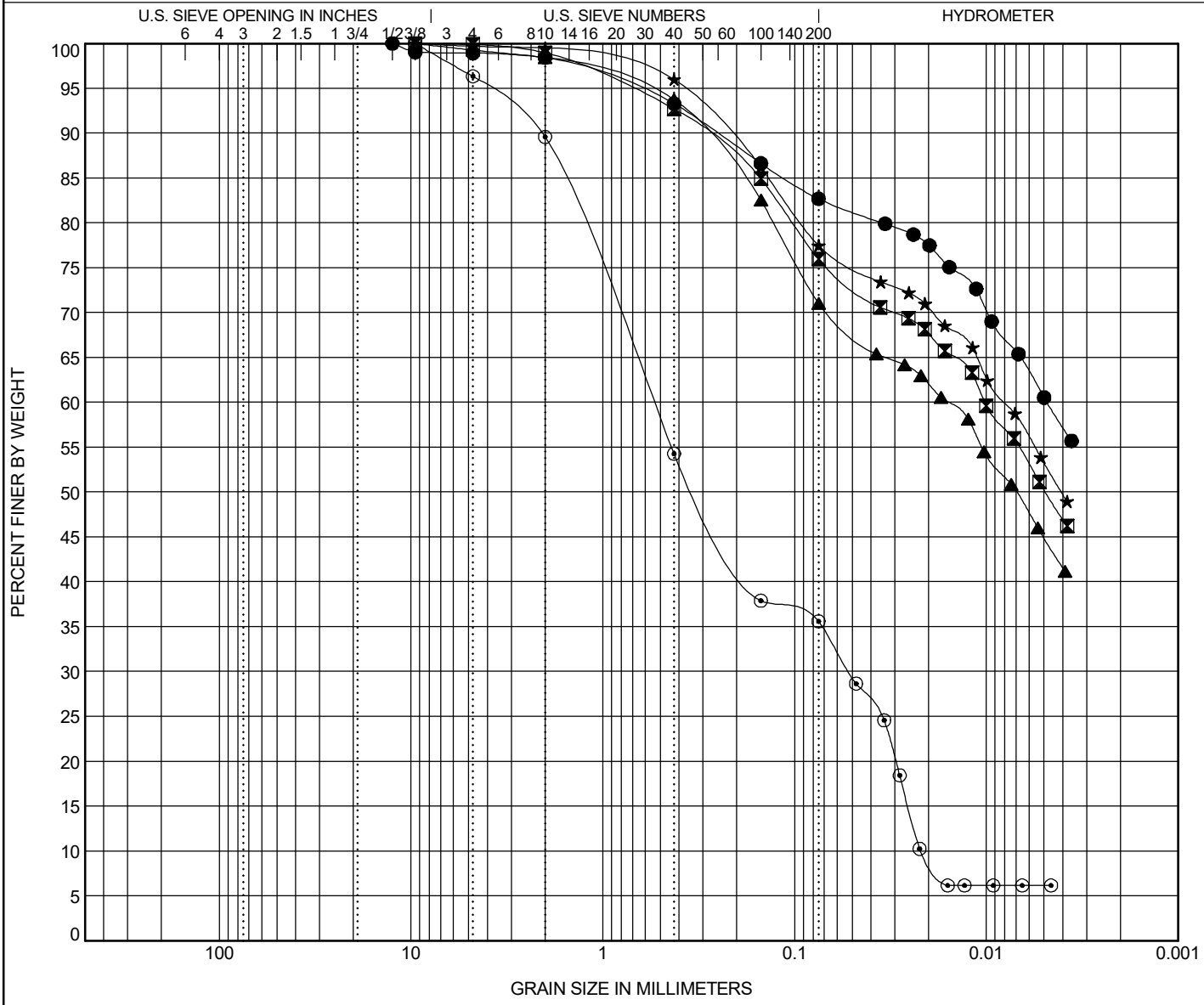
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-016-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**47**	**25**	**22**
⊠	B-016-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**48**	**25**	**23**
▲	B-017-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**48**	**25**	**23**
★	B-017-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**46**	**23**	**23**
⊙	B-018-0-22	1.0	**A-4a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-016-0-22	1.0	**0.254**				**1**	**5**	**11**	**22**	**61**		
⊠	B-016-0-22	2.5	**0.296**	**0.005**			**1**	**6**	**17**	**26**	**50**		
▲	B-017-0-22	1.0	**0.3**	**0.007**			**1**	**5**	**23**	**26**	**45**		
★	B-017-0-22	2.5	**0.225**	**0.004**			**0**	**4**	**19**	**24**	**53**		
⊙	B-018-0-22	1.0	**2.109**	**0.324**	**0.052**	**0.022**	**10**	**35**	**19**	**30**	**6**	**0.23**	**24.98**

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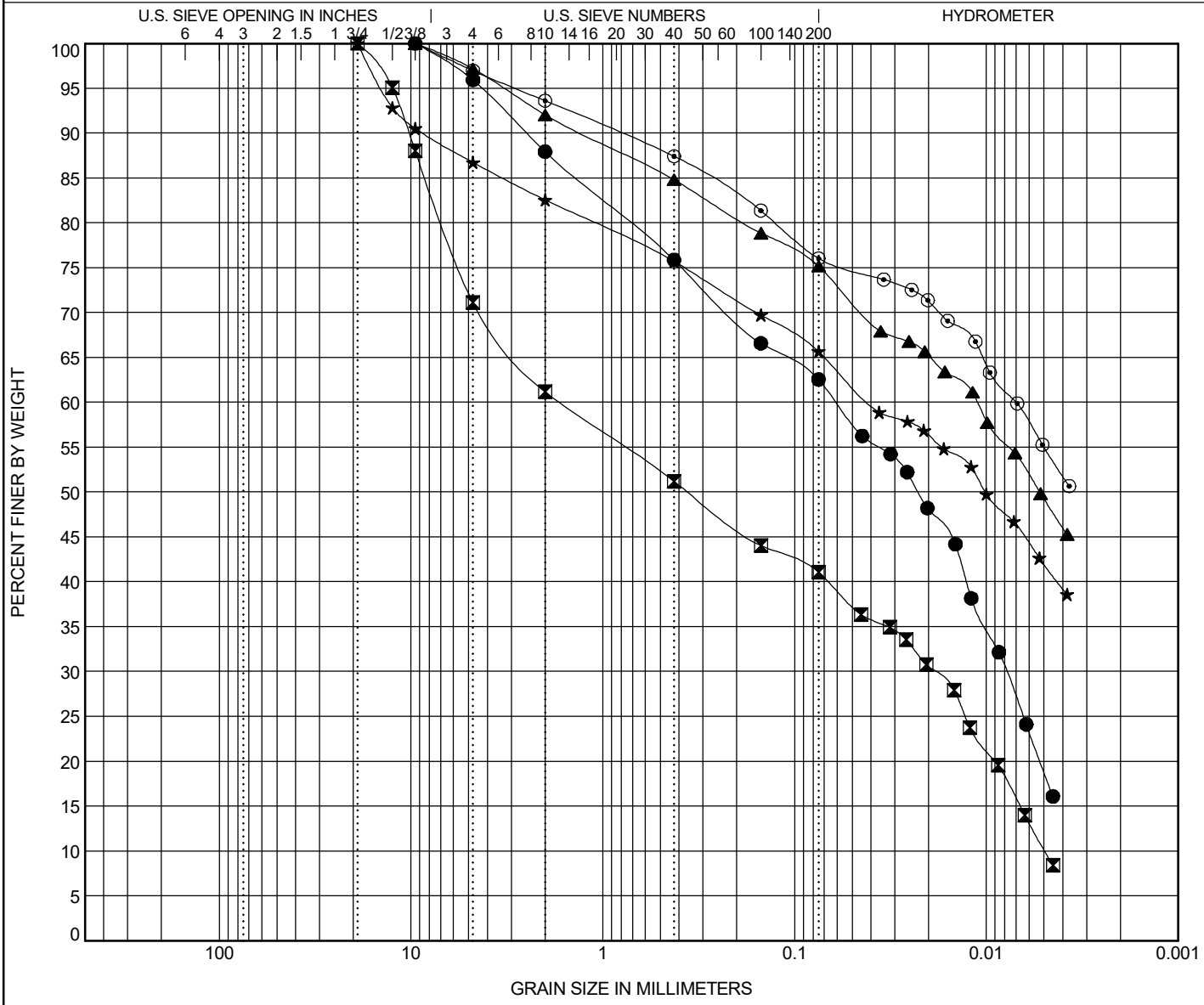
OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-018-0-22	2.5	**A-7-6 ~ SANDY LEAN CLAY(CL)**	47	23	24
⊠	B-019-0-22	1.0	**A-6b ~ CLAYEY SAND with GRAVEL(SC)**	37	19	18
▲	B-019-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	42	21	21
★	B-020-0-22	1.0	**A-7-6 ~ SANDY LEAN CLAY(CL)**	42	22	20
⊙	B-020-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	43	22	21

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-018-0-22	2.5	2.502	0.023	0.008		12	12	13	44	19		
⊠	B-019-0-22	1.0	10.263	0.357	0.019	0.005	39	10	10	31	10	0.04	336.99
▲	B-019-0-22	2.5	1.293	0.005			8	7	10	26	49		
★	B-020-0-22	1.0	8.64	0.01			17	7	10	24	42		
⊙	B-020-0-22	2.5	0.81				7	6	11	21	55		

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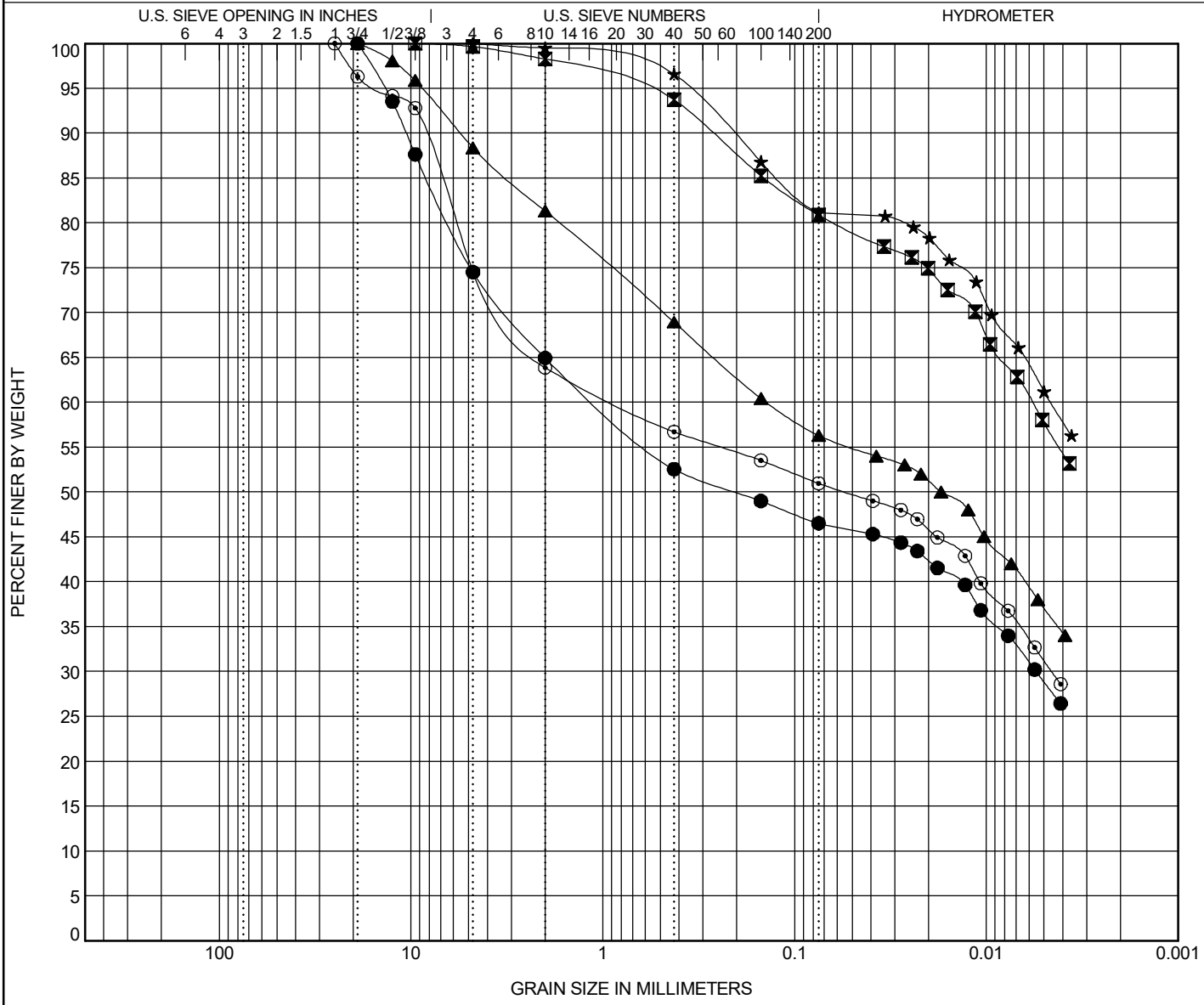
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-021-0-22	1.0	**A-6b ~ CLAYEY SAND with GRAVEL(SC)**	**36**	**16**	**20**
⊠	B-021-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**20**	**23**
▲	B-022-0-22	2.5	**A-6b ~ SANDY LEAN CLAY(CL)**	**37**	**20**	**17**
★	B-022-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**
⊙	B-023-0-22	1.0	**A-7-6 ~ GRAVELLY LEAN CLAY with SAND(CL)**	**41**	**20**	**21**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-021-0-22	1.0	**10.608**	**0.201**	**0.006**		**35**	**12**	**6**	**18**	**29**		
⊠	B-021-0-22	2.5	**0.269**				**1**	**5**	**13**	**23**	**58**		
▲	B-022-0-22	2.5	**5.522**	**0.017**			**19**	**12**	**13**	**19**	**37**		
★	B-022-0-22	4.0	**0.211**				**1**	**3**	**15**	**20**	**61**		
⊙	B-023-0-22	1.0	**8.544**	**0.054**	**0.005**		**36**	**7**	**6**	**20**	**31**		

GRAIN SIZE DISTRIBUTION

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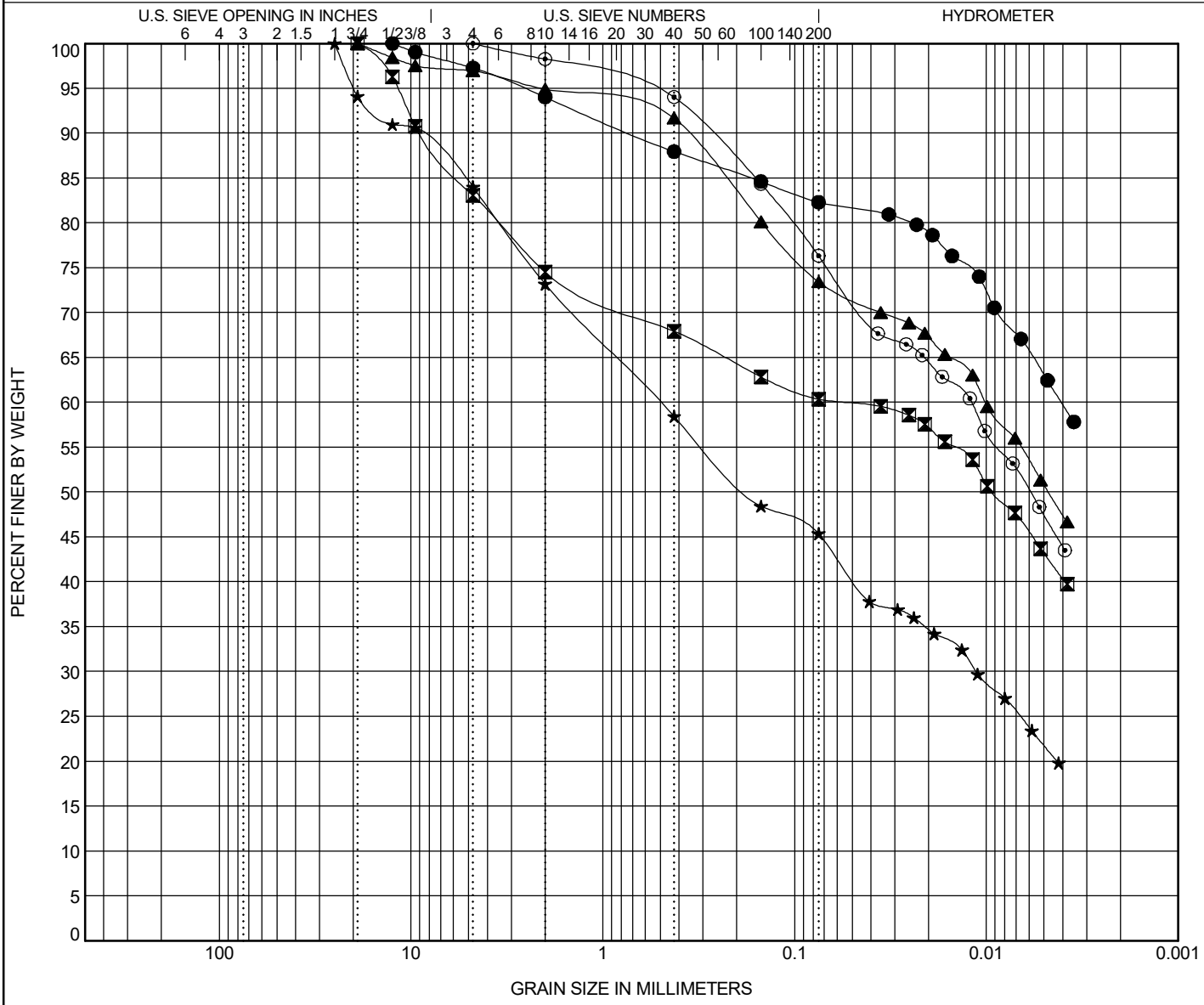
OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-023-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**21**	**22**
⊠	B-024-0-22	1.0	**A-7-6 ~ SANDY LEAN CLAY with GRAVEL(CL)**	**41**	**20**	**21**
▲	B-024-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**45**	**23**	**22**
★	B-025-0-22	1.0	**A-7-6 ~ CLAYEY SAND with GRAVEL(SC)**	**41**	**20**	**21**
⊙	B-025-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-023-0-22	2.5	**0.718**				**6**	**6**	**6**	**19**	**63**		
⊠	B-024-0-22	1.0	**8.869**	**0.009**			**25**	**7**	**8**	**17**	**43**		
▲	B-024-0-22	2.5	**0.365**	**0.005**			**6**	**3**	**18**	**22**	**51**		
★	B-025-0-22	1.0	**8.906**	**0.177**	**0.011**		**27**	**15**	**13**	**23**	**22**		
⊙	B-025-0-22	2.5	**0.275**	**0.006**			**2**	**4**	**18**	**29**	**47**		

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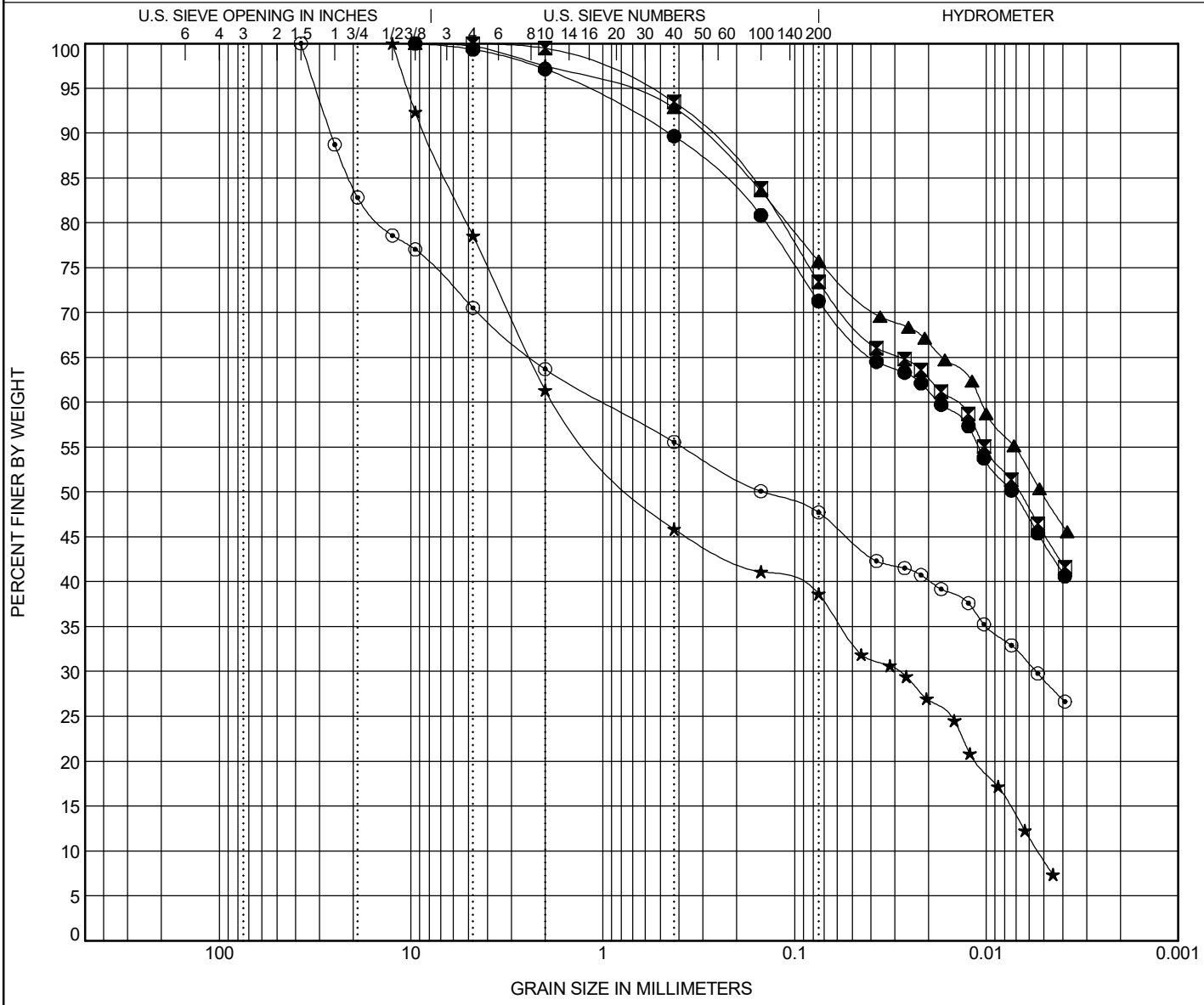
GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-026-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**45**	**23**	**22**
⊠	B-026-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**
▲	B-027-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**47**	**21**	**26**
★	B-027-0-22	2.5	**A-7-6 ~ CLAYEY SAND with GRAVEL(SC)**	**41**	**20**	**21**
⊙	B-028-0-22	1.0	**A-7-6 ~ CLAYEY GRAVEL with SAND(GC)**	**42**	**21**	**21**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-026-0-22	1.0	**0.456**	**0.007**			**4**	**7**	**18**	**27**	**44**		
⊠	B-026-0-22	2.5	**0.292**	**0.007**			**1**	**6**	**20**	**28**	**45**		
▲	B-027-0-22	1.0	**0.309**	**0.005**			**2**	**5**	**17**	**26**	**50**		
★	B-027-0-22	2.5	**8.438**	**0.643**	**0.029**	**0.005**	**39**	**15**	**7**	**30**	**9**	**0.09**	**323.72**
⊙	B-028-0-22	1.0	**26.17**	**0.147**	**0.006**		**36**	**8**	**8**	**19**	**29**		

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GRAIN SIZE DISTRIBUTION

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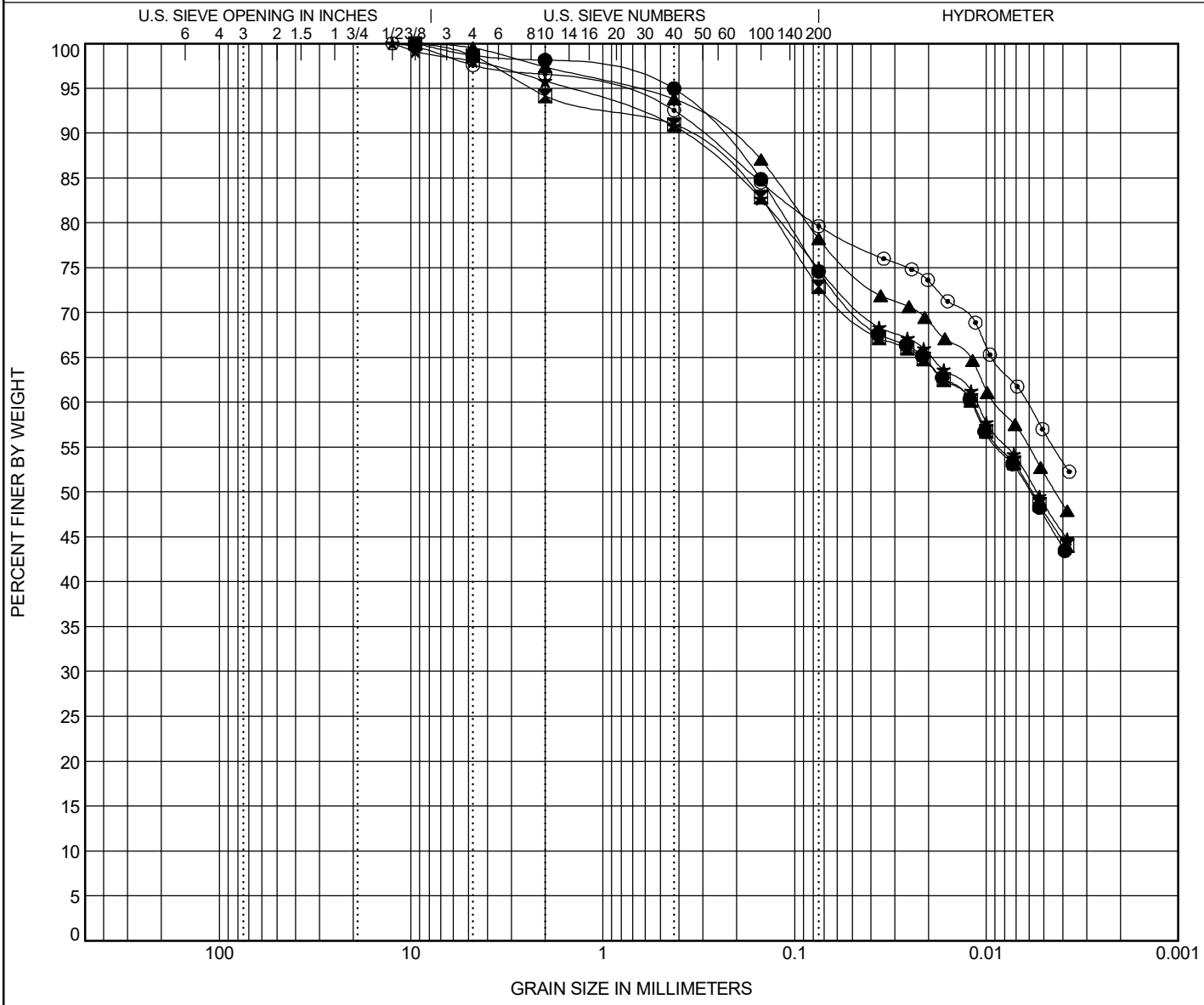
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-028-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**21**	**22**
⊠	B-029-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**22**	**22**
▲	B-029-0-22	4.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**44**	**23**	**21**
★	B-030-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**20**	**22**
⊙	B-030-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**43**	**21**	**22**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-028-0-22	2.5	**0.255**	**0.006**			**2**	**3**	**20**	**28**	**47**		
⊠	B-029-0-22	2.5	**0.375**	**0.006**			**6**	**3**	**18**	**25**	**48**		
▲	B-029-0-22	4.0	**0.236**	**0.004**			**2**	**4**	**16**	**26**	**52**		
★	B-030-0-22	1.0	**0.384**	**0.005**			**4**	**5**	**16**	**26**	**49**		
⊙	B-030-0-22	2.5	**0.305**				**3**	**4**	**13**	**23**	**57**		

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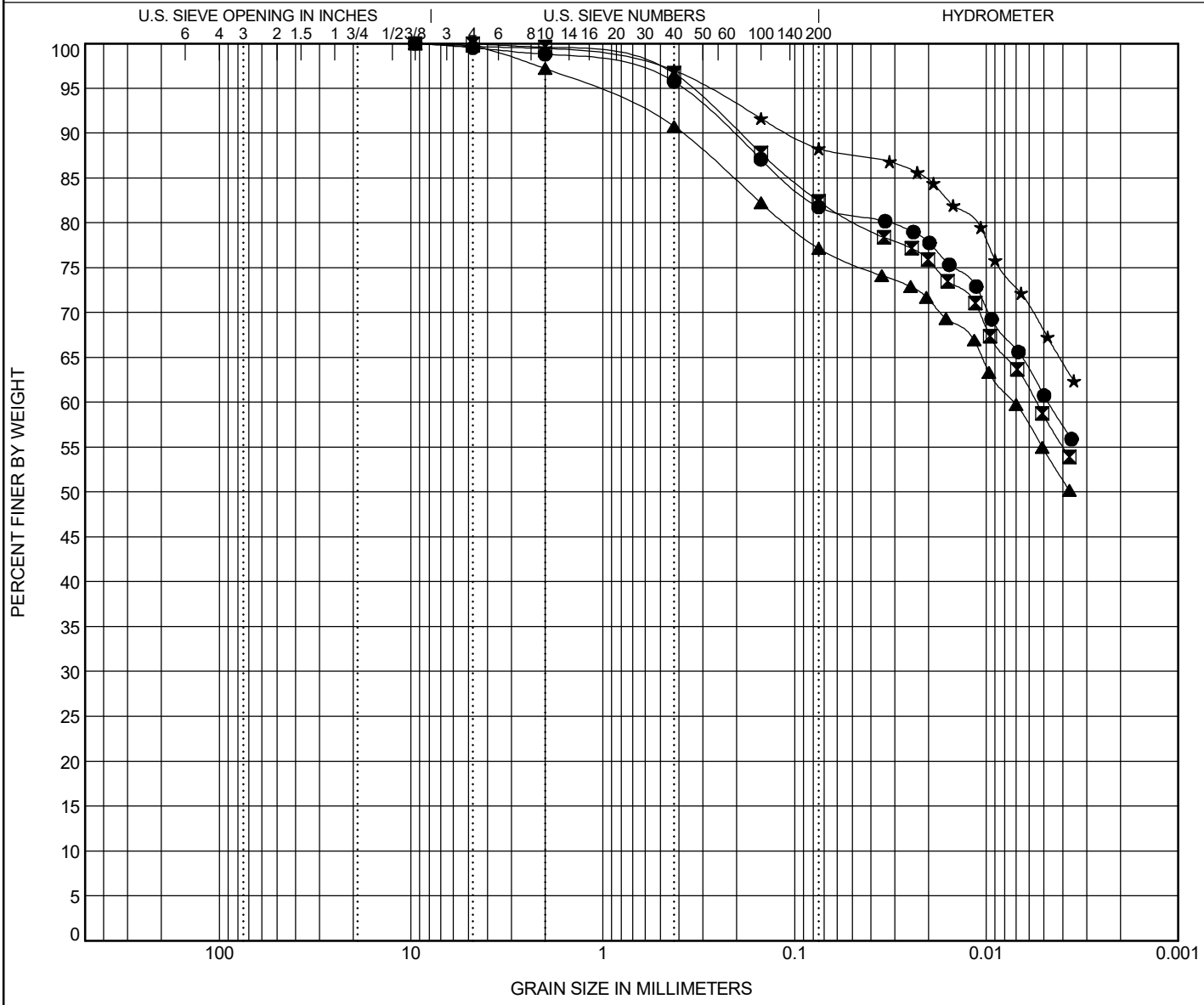
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-031-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**41**	**20**	**21**
⊠	B-031-0-22	2.5	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**42**	**20**	**22**
▲	B-032-0-22	1.0	**A-7-6 ~ LEAN CLAY with SAND(CL)**	**45**	**22**	**23**
★	B-032-0-22	2.5	**A-7-6 ~ LEAN CLAY(CL)**	**44**	**21**	**23**

	Specimen Identification		D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-031-0-22	1.0	**0.213**				**1**	**3**	**14**	**21**	**61**		
⊠	B-031-0-22	2.5	**0.194**				**1**	**3**	**14**	**24**	**58**		
▲	B-032-0-22	1.0	**0.387**				**3**	**6**	**14**	**22**	**55**		
★	B-032-0-22	2.5	**0.107**				**1**	**2**	**9**	**20**	**68**		

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GRAIN SIZE DISTRIBUTION

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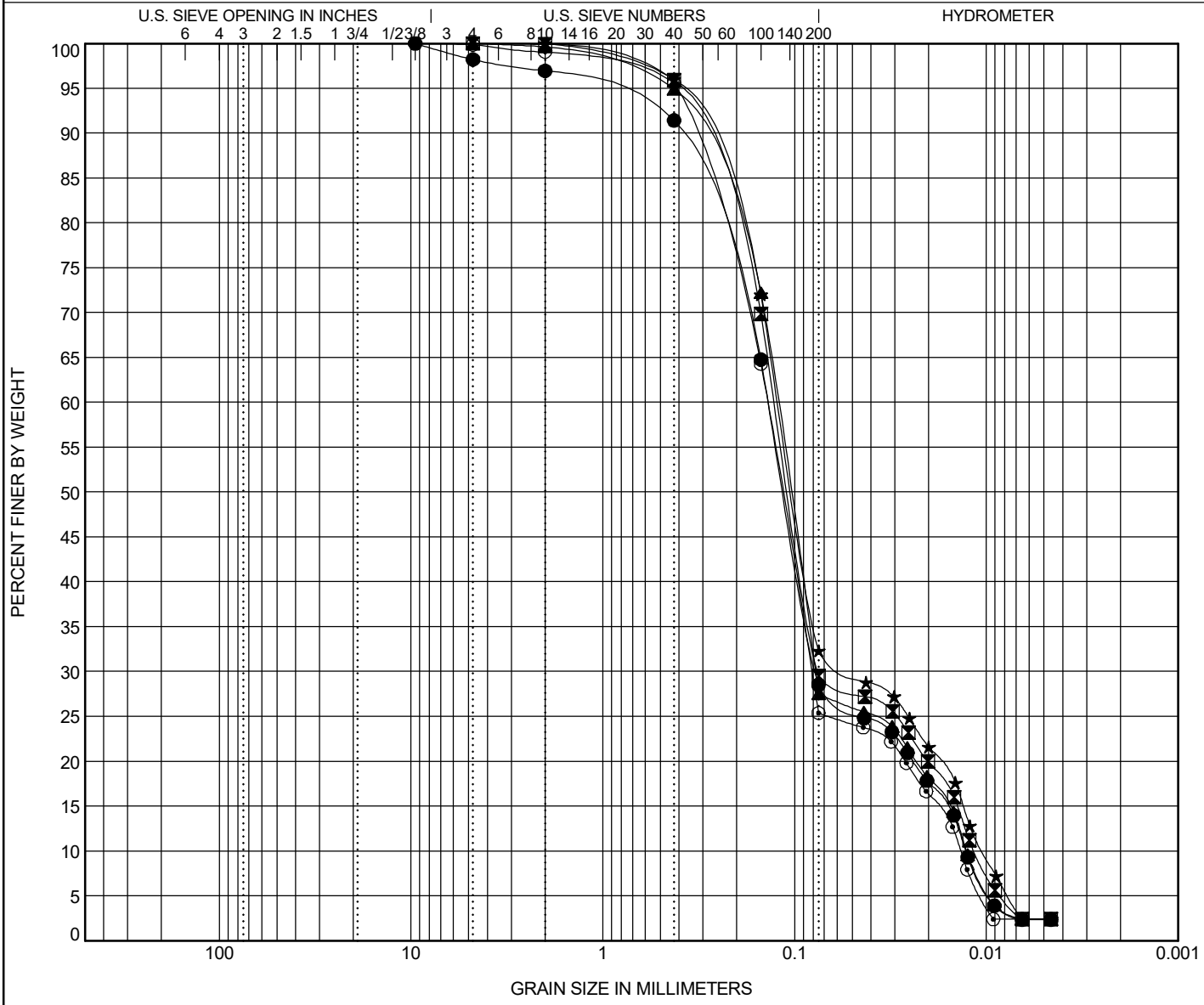
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-033-0-22	1.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊠	B-033-0-22	3.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
▲	B-034-0-22	2.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
★	B-034-0-22	3.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊙	B-035-0-22	1.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-033-0-22	1.5	**0.402**	**0.113**	**0.077**	**0.013**	**2**	**6**	**63**	**27**	**2**	**3.39**	**10.68**
⊠	B-033-0-22	3.0	**0.336**	**0.107**	**0.076**	**0.012**	**1**	**4**	**66**	**27**	**2**	**3.93**	**11.00**
▲	B-034-0-22	2.0	**0.339**	**0.106**	**0.078**	**0.013**	**1**	**5**	**67**	**25**	**2**	**3.86**	**9.78**
★	B-034-0-22	3.5	**0.328**	**0.102**	**0.052**	**0.01**	**0**	**4**	**64**	**30**	**2**	**2.11**	**11.67**
⊙	B-035-0-22	1.5	**0.353**	**0.116**	**0.081**	**0.014**	**2**	**3**	**70**	**23**	**2**	**3.51**	**10.22**

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GRAIN SIZE DISTRIBUTION

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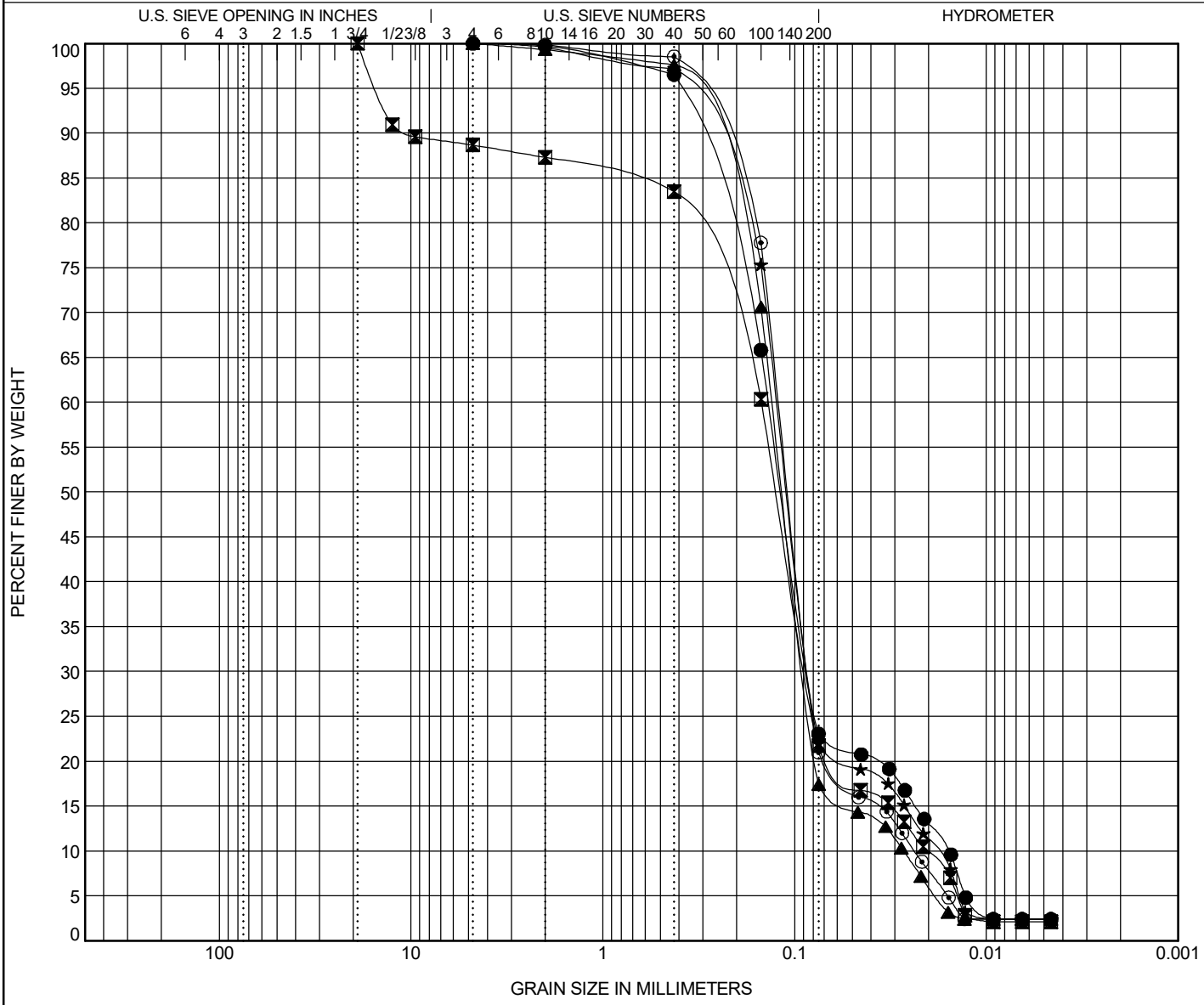
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-035-0-22	3.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-036-0-22	1.4	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-036-0-22	2.9	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-037-0-22	1.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-037-0-22	3.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-035-0-22	3.0	0.341	0.116	0.084	0.016	1	3	73	21	2	3.26	8.62
⊠	B-036-0-22	1.4	10.315	0.125	0.087	0.02	12	4	62	20	2	2.49	7.31
▲	B-036-0-22	2.9	0.317	0.115	0.088	0.027	1	2	80	15	2	2.21	4.83
★	B-037-0-22	1.7	0.301	0.108	0.083	0.018	1	2	75	20	2	3.10	6.76
⊙	B-037-0-22	3.2	0.277	0.107	0.084	0.024	0	1	78	19	2	2.44	5.08

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GRAIN SIZE DISTRIBUTION

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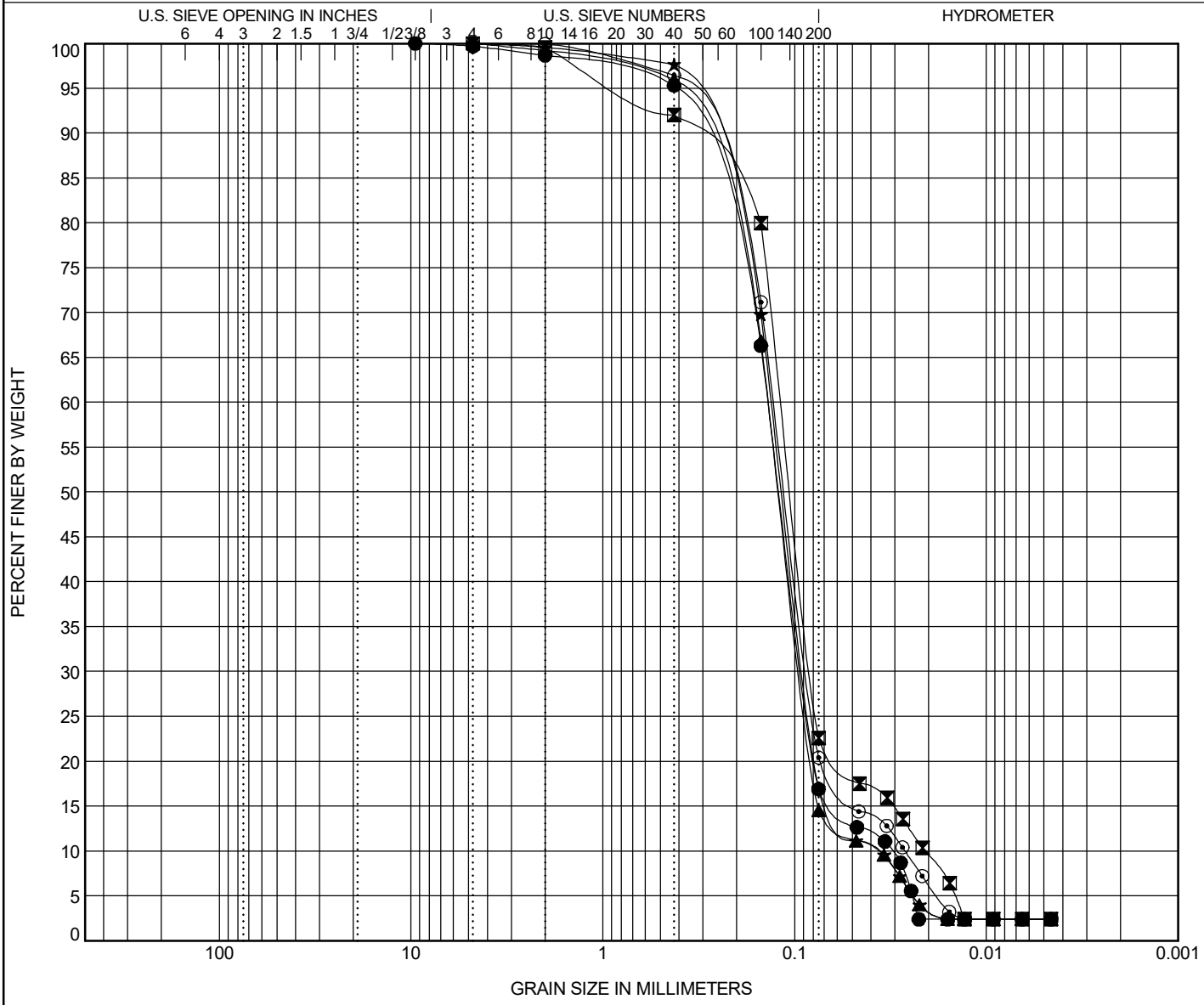
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-038-0-22	1.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-038-0-22	3.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-039-0-22	1.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-039-0-22	2.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-040-0-22	1.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-038-0-22	1.7	0.351	0.119	0.09	0.031	2	3	78	15	2	1.90	4.41
⊠	B-038-0-22	3.2	0.357	0.104	0.082	0.021	0	8	69	21	2	2.73	5.64
▲	B-039-0-22	1.2	0.343	0.12	0.092	0.038	2	3	81	12	2	1.64	3.62
★	B-039-0-22	2.7	0.319	0.116	0.089	0.038	0	2	81	15	2	1.60	3.52
⊙	B-040-0-22	1.2	0.326	0.112	0.086	0.027	1	3	76	18	2	2.13	4.84

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GRAIN SIZE DISTRIBUTION

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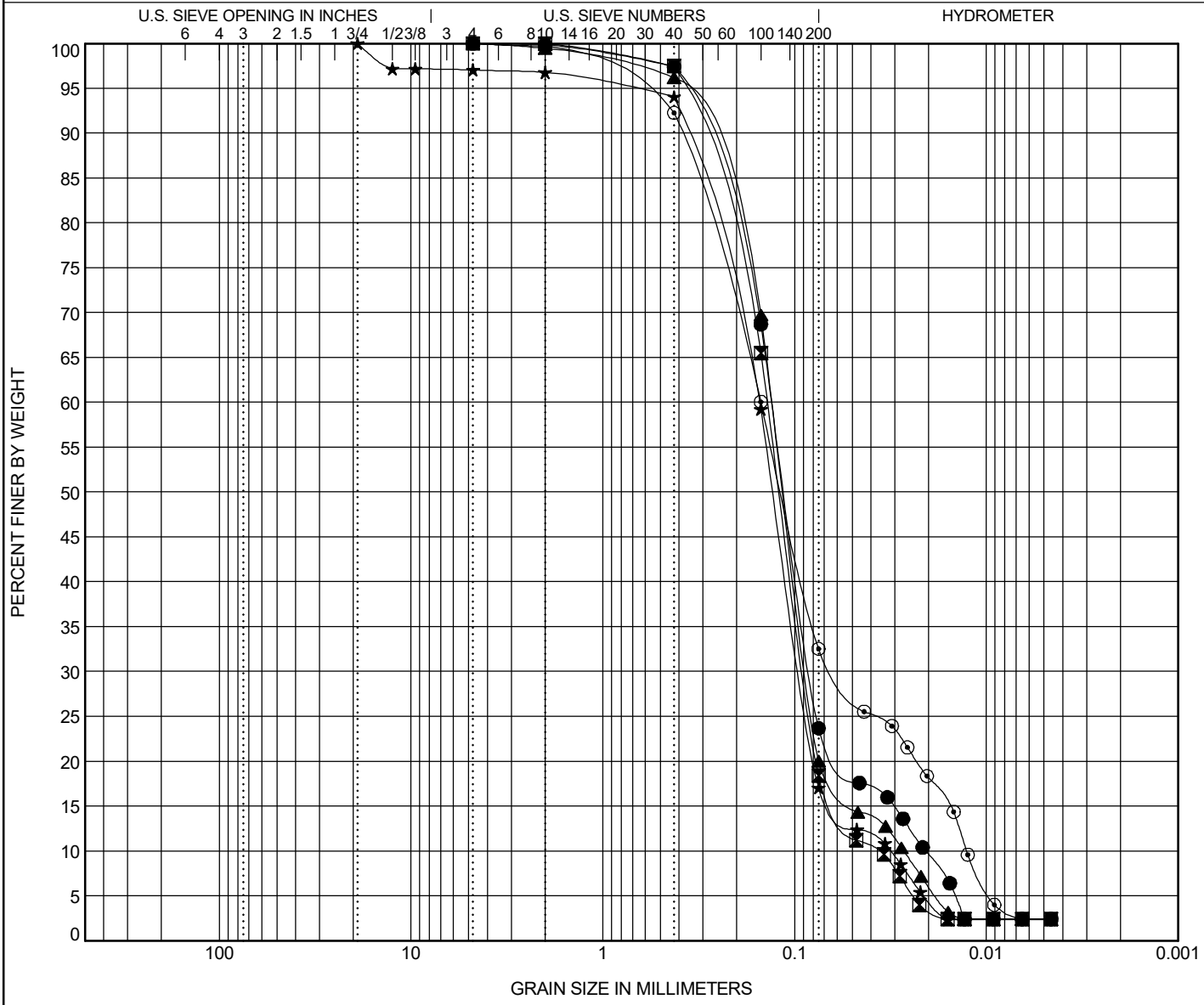
PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-040-0-22	2.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-041-0-22	1.3	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-041-0-22	2.8	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-042-0-22	1.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-042-0-22	2.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-040-0-22	2.7	0.325	0.112	0.083	0.021	0	2	74	22	2	2.50	6.29
⊠	B-041-0-22	1.3	0.333	0.119	0.089	0.037	1	2	79	16	2	1.54	3.72
▲	B-041-0-22	2.8	0.333	0.114	0.086	0.027	1	3	76	18	2	2.10	4.85
★	B-042-0-22	1.2	0.376	0.129	0.093	0.032	3	3	77	15	2	1.78	4.86
⊙	B-042-0-22	2.7	0.395	0.116	0.062	0.013	0	7	60	31	2	2.00	11.81

GRAIN SIZE DISTRIBUTION

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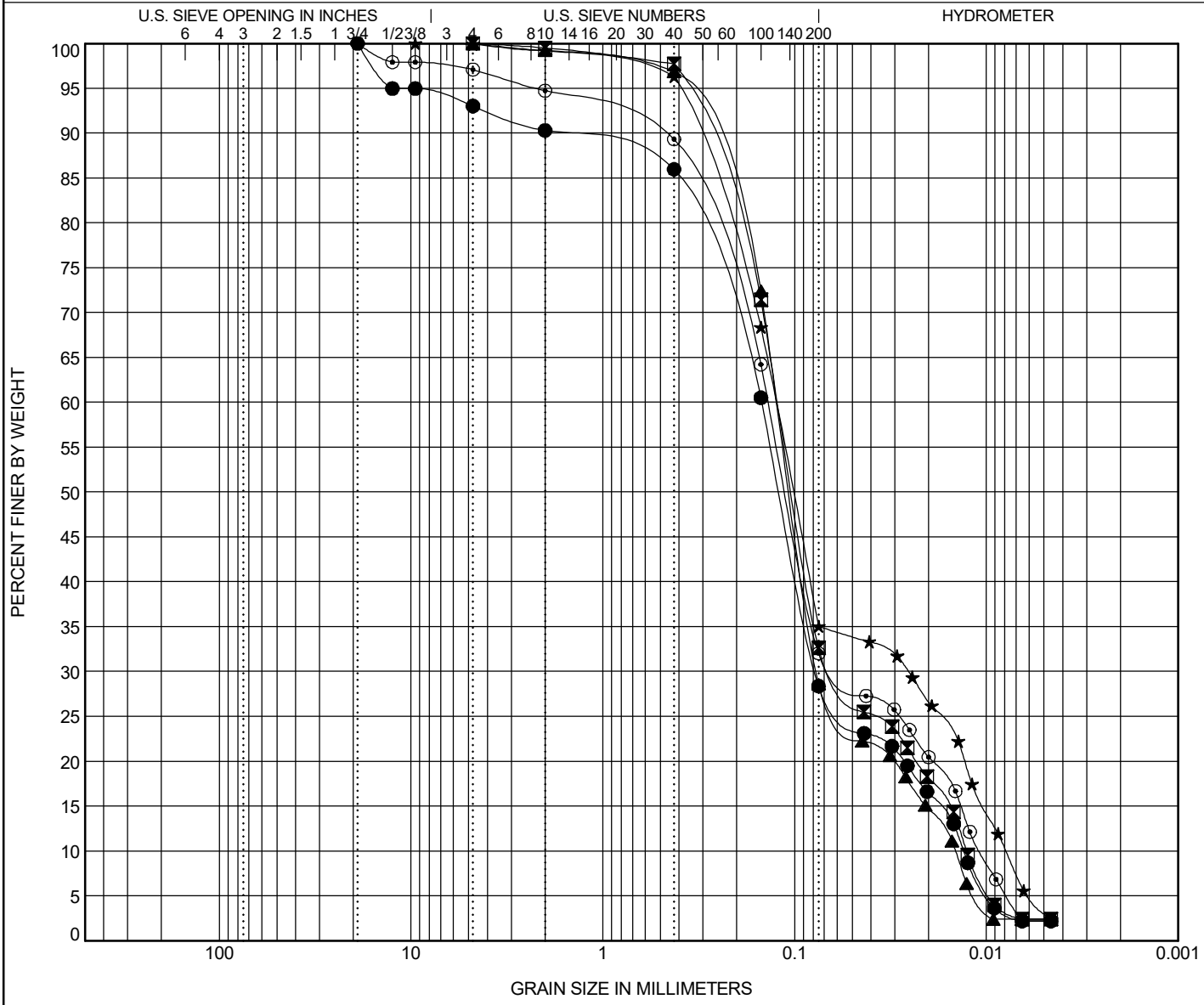
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-043-0-22	1.2	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-043-0-22	2.7	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-044-0-22	1.3	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-044-0-22	2.8	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-045-0-22	1.3	A-3a ~ SILTY SAND(SM)	NP	NP	NP

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-043-0-22	1.2	1.795	0.12	0.078	0.013	10	4	58	26	2	3.09	11.27
⊠	B-043-0-22	2.7	0.313	0.102	0.061	0.013	0	2	65	31	2	2.42	9.63
▲	B-044-0-22	1.3	0.318	0.105	0.077	0.015	1	2	68	27	2	3.29	8.50
★	B-044-0-22	2.8	0.336	0.102	0.026	0.008	1	3	61	32	3	0.65	15.88
⊙	B-045-0-22	1.3	0.515	0.11	0.059	0.011	6	5	57	30	2	2.35	12.73

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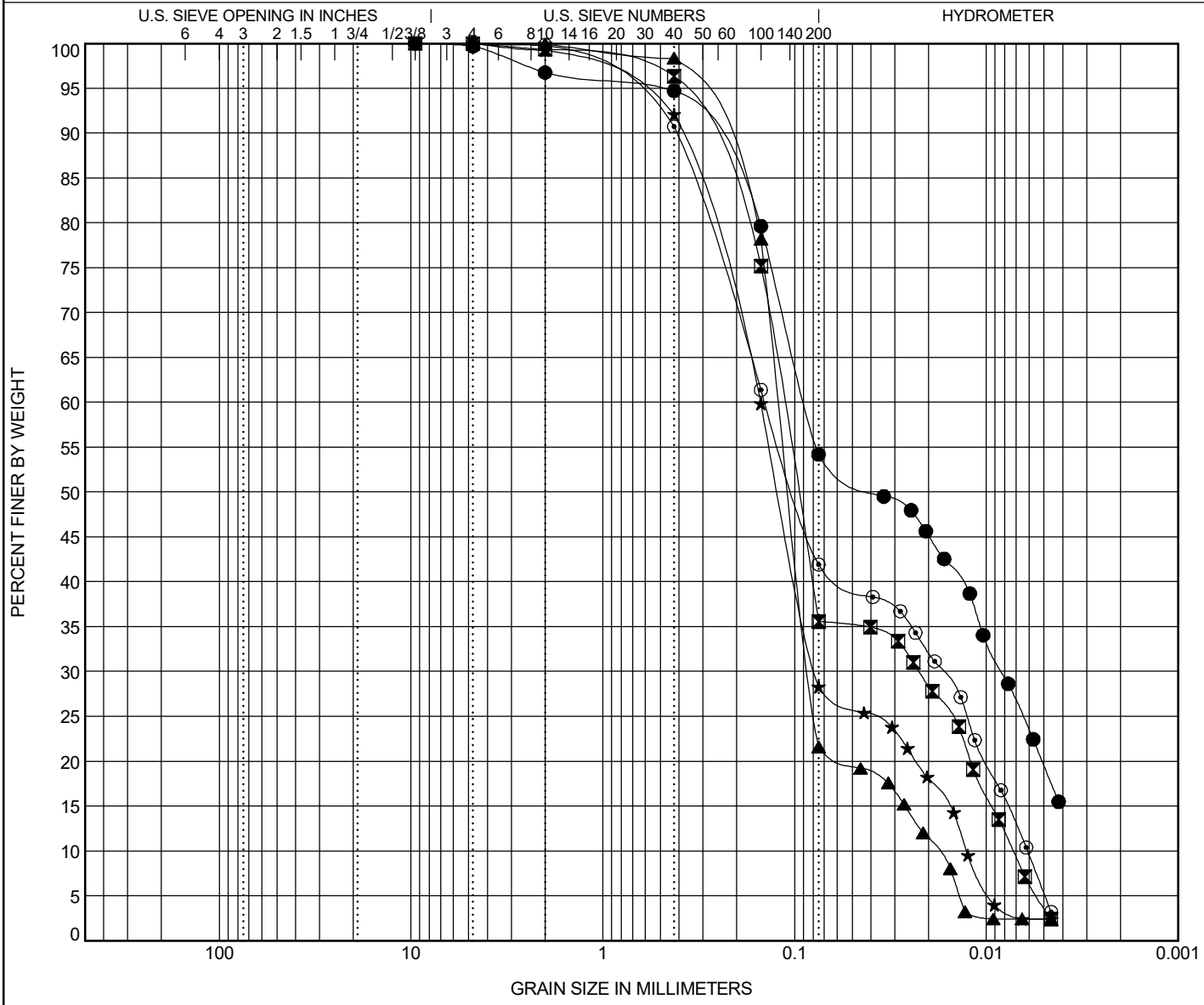
OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-045-0-22	2.8	A-4a ~ SANDY SILT(ML)	19	16	3
⊠	B-046-0-22	1.0	A-4a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-046-0-22	2.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-047-0-22	1.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-047-0-22	3.0	~			

	Specimen Identification		D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-045-0-22	2.8	0.307	0.037	0.008		3	2	41	35	19		
⊠	B-046-0-22	1.0	0.311	0.097	0.022	0.007	0	3	61	32	4	0.60	15.87
▲	B-046-0-22	2.5	0.276	0.106	0.083	0.018	0	1	77	20	2	3.18	6.62
★	B-047-0-22	1.5	0.397	0.121	0.078	0.013	1	7	64	26	2	3.16	11.86
⊙	B-047-0-22	3.0	0.414	0.1	0.017	0.006	0	9	49	37	5	0.33	23.39

GRAIN SIZE DISTRIBUTION

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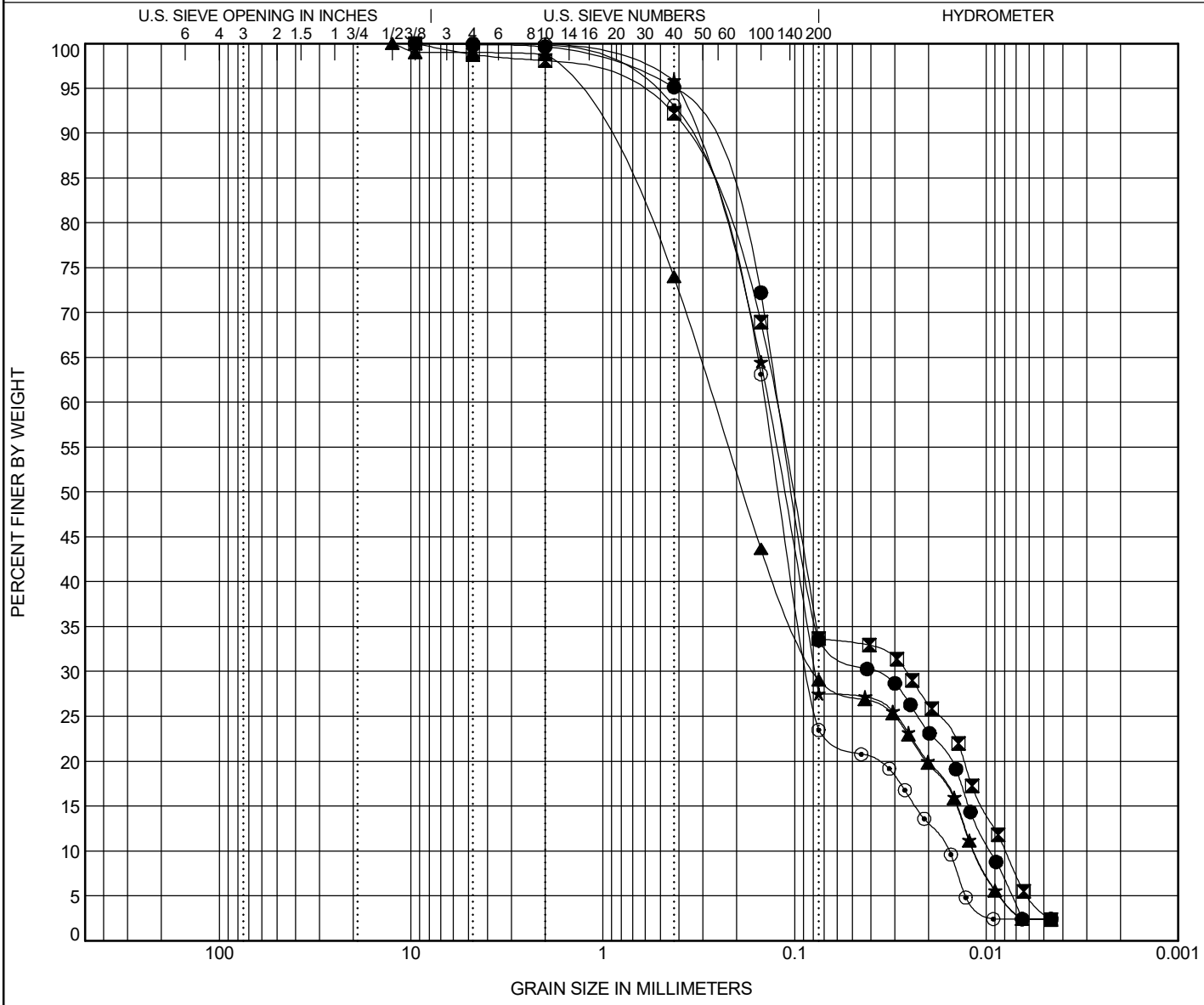
OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-048-0-22	1.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊠	B-048-0-22	3.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
▲	B-049-0-22	1.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
★	B-049-0-22	3.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊙	B-050-0-22	1.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-048-0-22	1.5	**0.336**	**0.101**	**0.04**	**0.01**	**1**	**4**	**62**	**31**	**2**	**1.37**	**12.65**
⊠	B-048-0-22	3.0	**0.385**	**0.103**	**0.026**	**0.008**	**1**	**6**	**59**	**31**	**3**	**0.69**	**15.76**
▲	B-049-0-22	1.5	**1.155**	**0.186**	**0.078**	**0.012**	**1**	**25**	**45**	**27**	**2**	**2.02**	**22.68**
★	B-049-0-22	3.0	**0.349**	**0.114**	**0.079**	**0.012**	**0**	**4**	**68**	**26**	**2**	**3.89**	**11.98**
⊙	B-050-0-22	1.5	**0.382**	**0.119**	**0.084**	**0.016**	**0**	**7**	**70**	**21**	**2**	**3.14**	**8.98**

GRAIN SIZE DISTRIBUTION

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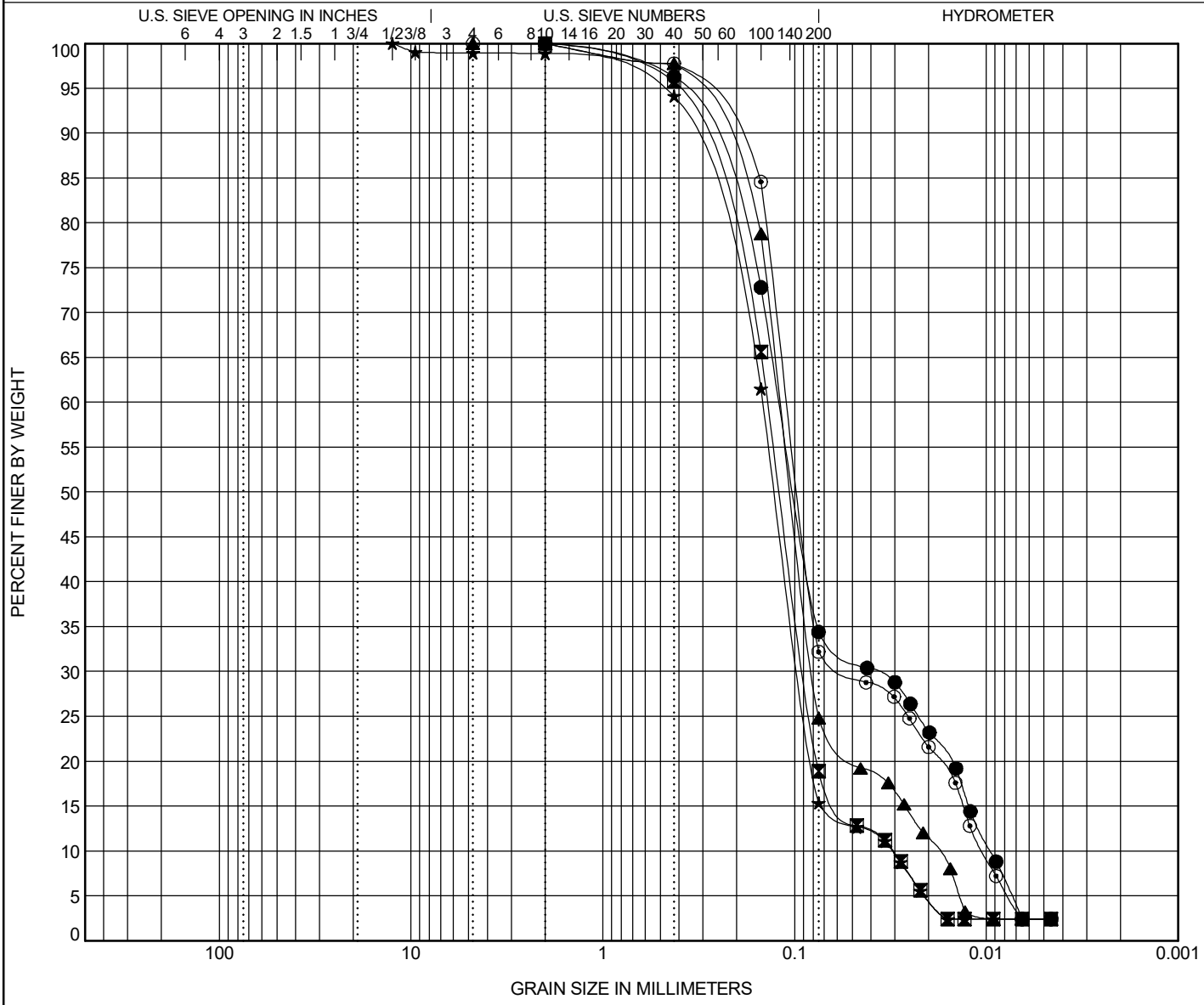
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-050-0-22	3.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-051-0-22	1.4	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-051-0-22	2.9	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-052-0-22	1.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-052-0-22	3.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP

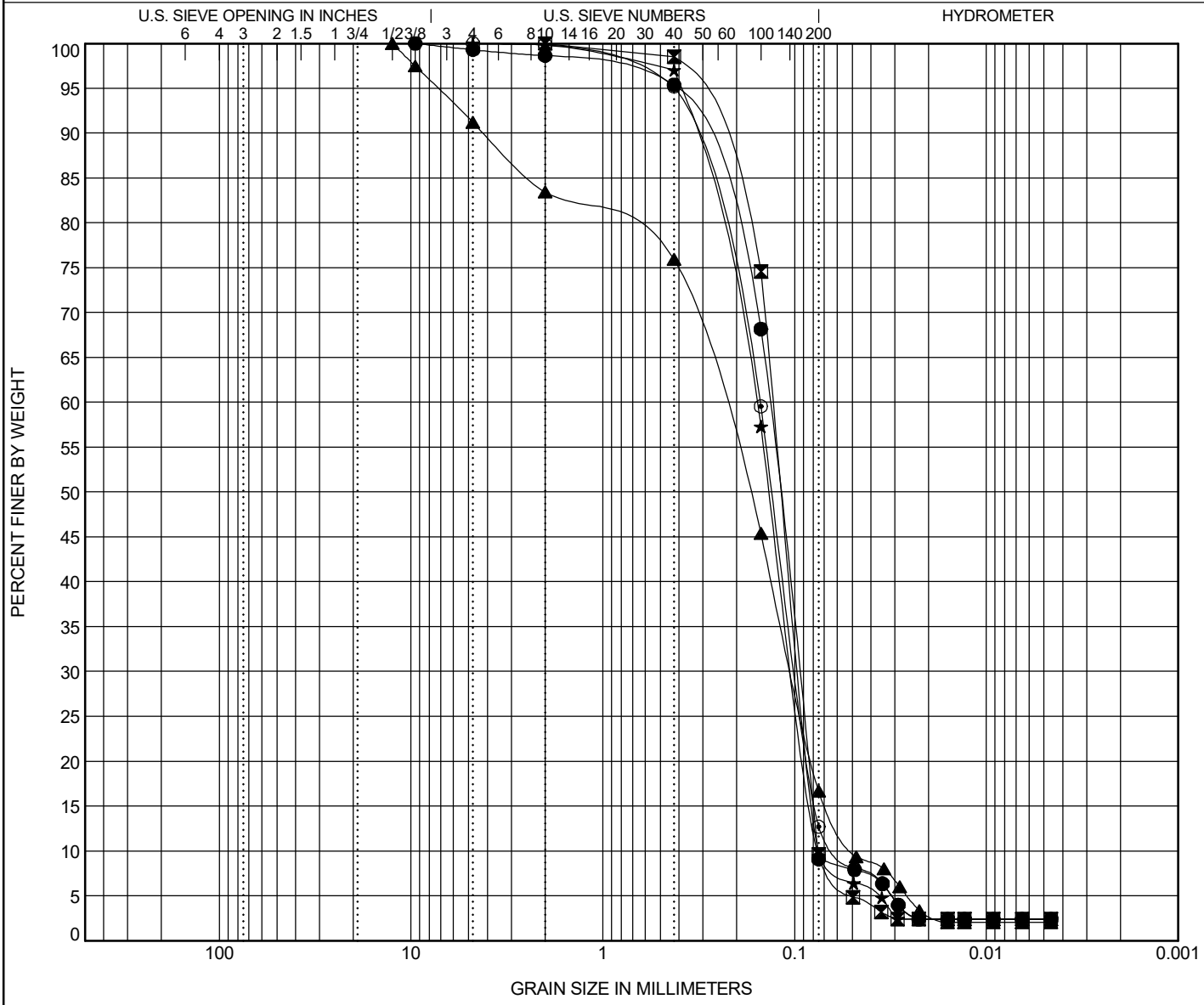
Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-050-0-22	3.0	0.321	0.099	0.039	0.01	0	4	62	32	2	1.32	12.52
⊠	B-051-0-22	1.4	0.348	0.119	0.088	0.031	0	4	77	17	2	1.84	4.48
▲	B-051-0-22	2.9	0.278	0.104	0.08	0.018	0	2	73	23	2	3.01	6.50
★	B-052-0-22	1.5	0.372	0.126	0.093	0.031	1	5	79	13	2	1.92	4.72
⊙	B-052-0-22	3.0	0.23	0.095	0.052	0.01	0	2	66	30	2	2.40	10.39

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-053-0-22	1.5	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
⊠	B-053-0-22	3.0	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
▲	B-054-0-22	2.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
★	B-054-0-22	4.0	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
⊙	B-055-0-22	1.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

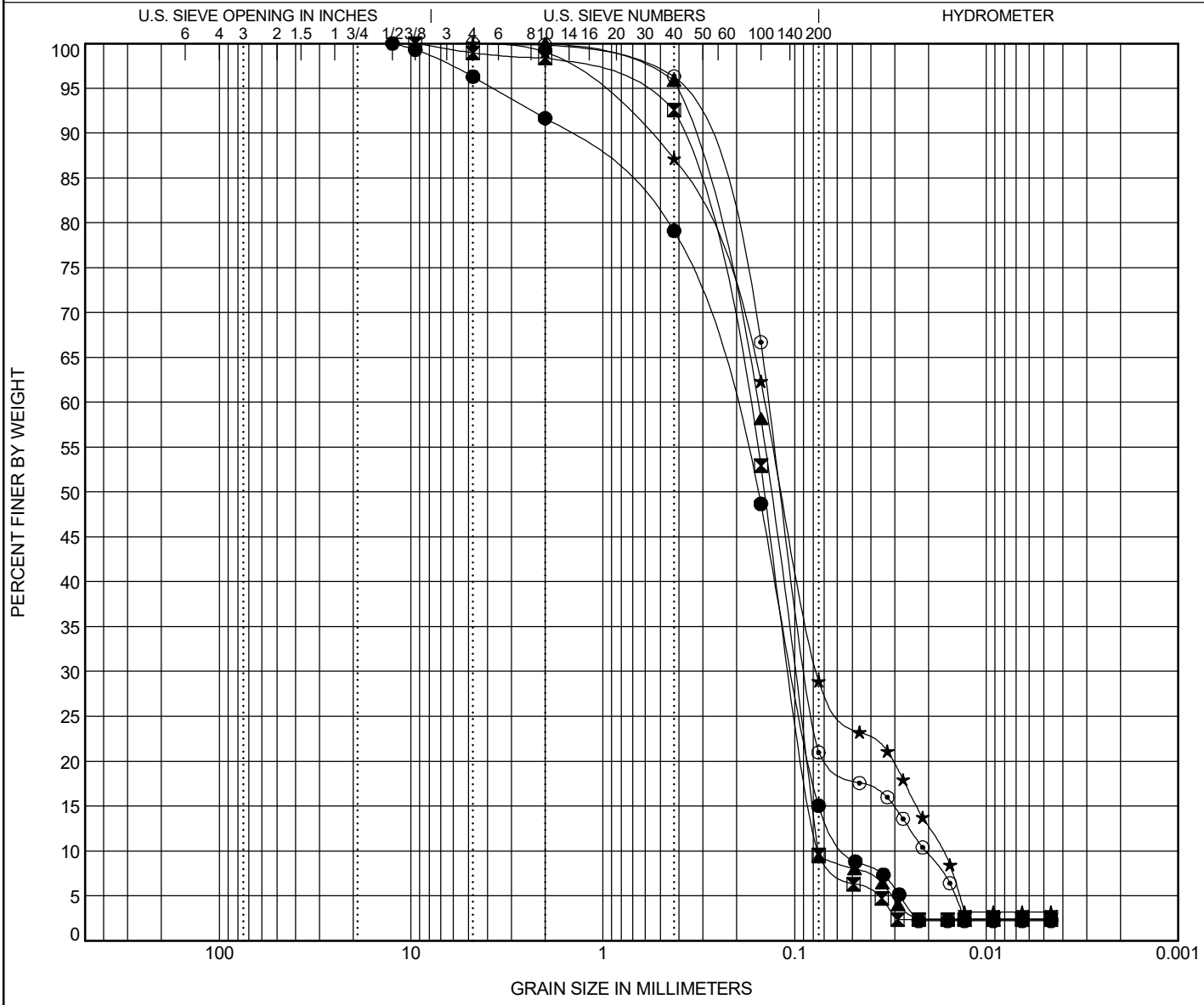
Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-053-0-22	1.5	**0.346**	**0.121**	**0.096**	**0.076**	**2**	**3**	**86**	**7**	**2**	**0.89**	**1.80**
⊠	B-053-0-22	3.0	**0.293**	**0.115**	**0.093**	**0.075**	**0**	**1**	**89**	**8**	**2**	**0.90**	**1.70**
▲	B-054-0-22	2.5	**4.154**	**0.176**	**0.103**	**0.05**	**16**	**8**	**59**	**15**	**2**	**0.87**	**4.96**
★	B-054-0-22	4.0	**0.353**	**0.135**	**0.101**	**0.076**	**0**	**3**	**88**	**7**	**2**	**0.84**	**2.13**
⊙	B-055-0-22	1.0	**0.365**	**0.13**	**0.097**	**0.059**	**0**	**4**	**83**	**11**	**2**	**1.05**	**2.59**

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-055-0-22	2.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊠	B-056-0-22	1.0	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
▲	B-056-0-22	2.5	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
★	B-057-0-22	1.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊙	B-057-0-22	2.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-055-0-22	2.5	**1.628**	**0.157**	**0.102**	**0.053**	**8**	**13**	**64**	**13**	**2**	**0.90**	**4.21**
⊠	B-056-0-22	1.0	**0.397**	**0.143**	**0.104**	**0.076**	**1**	**6**	**83**	**8**	**2**	**0.79**	**2.39**
▲	B-056-0-22	2.5	**0.361**	**0.134**	**0.101**	**0.076**	**0**	**4**	**87**	**7**	**2**	**0.85**	**2.08**
★	B-057-0-22	1.0	**0.615**	**0.116**	**0.077**	**0.017**	**1**	**12**	**58**	**26**	**3**	**2.41**	**8.37**
⊙	B-057-0-22	2.5	**0.34**	**0.116**	**0.086**	**0.021**	**1**	**3**	**75**	**19**	**2**	**2.62**	**6.50**

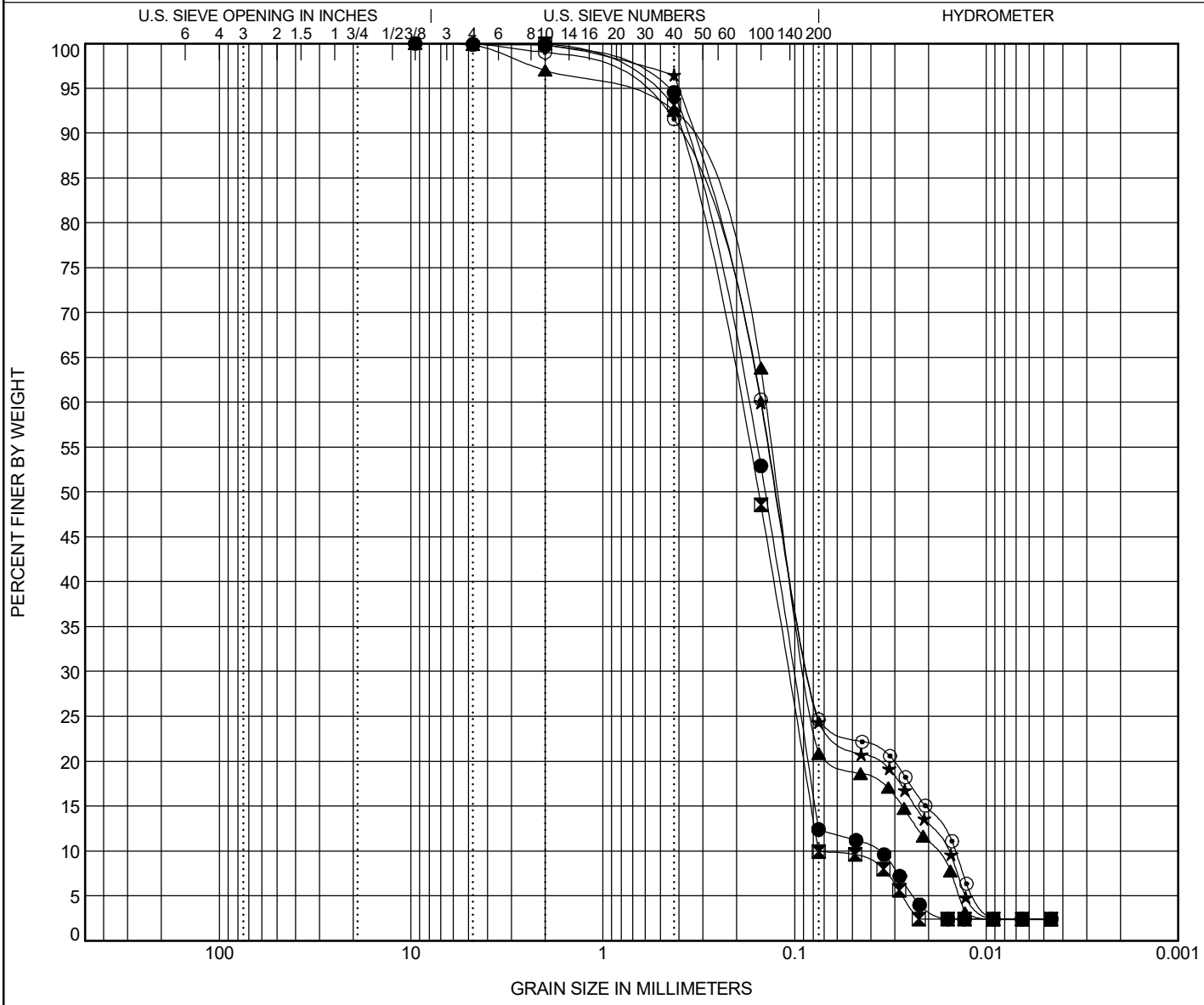
GRAIN SIZE - OH DOT.GDT - 1/17/23 12:11 - S:\PROJECTS\2223901.GPJ

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-058-0-22	1.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊠	B-058-0-22	2.5	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
▲	B-059-0-22	1.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
★	B-059-0-22	4.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊙	B-060-0-22	2.5	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-058-0-22	1.0	**0.379**	**0.143**	**0.101**	**0.037**	**1**	**5**	**82**	**10**	**2**	**1.54**	**4.80**
⊠	B-058-0-22	2.5	**0.395**	**0.155**	**0.108**	**0.075**	**0**	**7**	**83**	**8**	**2**	**0.79**	**2.61**
▲	B-059-0-22	1.0	**0.388**	**0.12**	**0.087**	**0.019**	**3**	**4**	**72**	**19**	**2**	**2.88**	**7.59**
★	B-059-0-22	4.0	**0.353**	**0.124**	**0.084**	**0.016**	**1**	**3**	**72**	**22**	**2**	**2.95**	**9.48**
⊙	B-060-0-22	2.5	**0.403**	**0.123**	**0.083**	**0.015**	**1**	**7**	**67**	**23**	**2**	**3.20**	**10.27**

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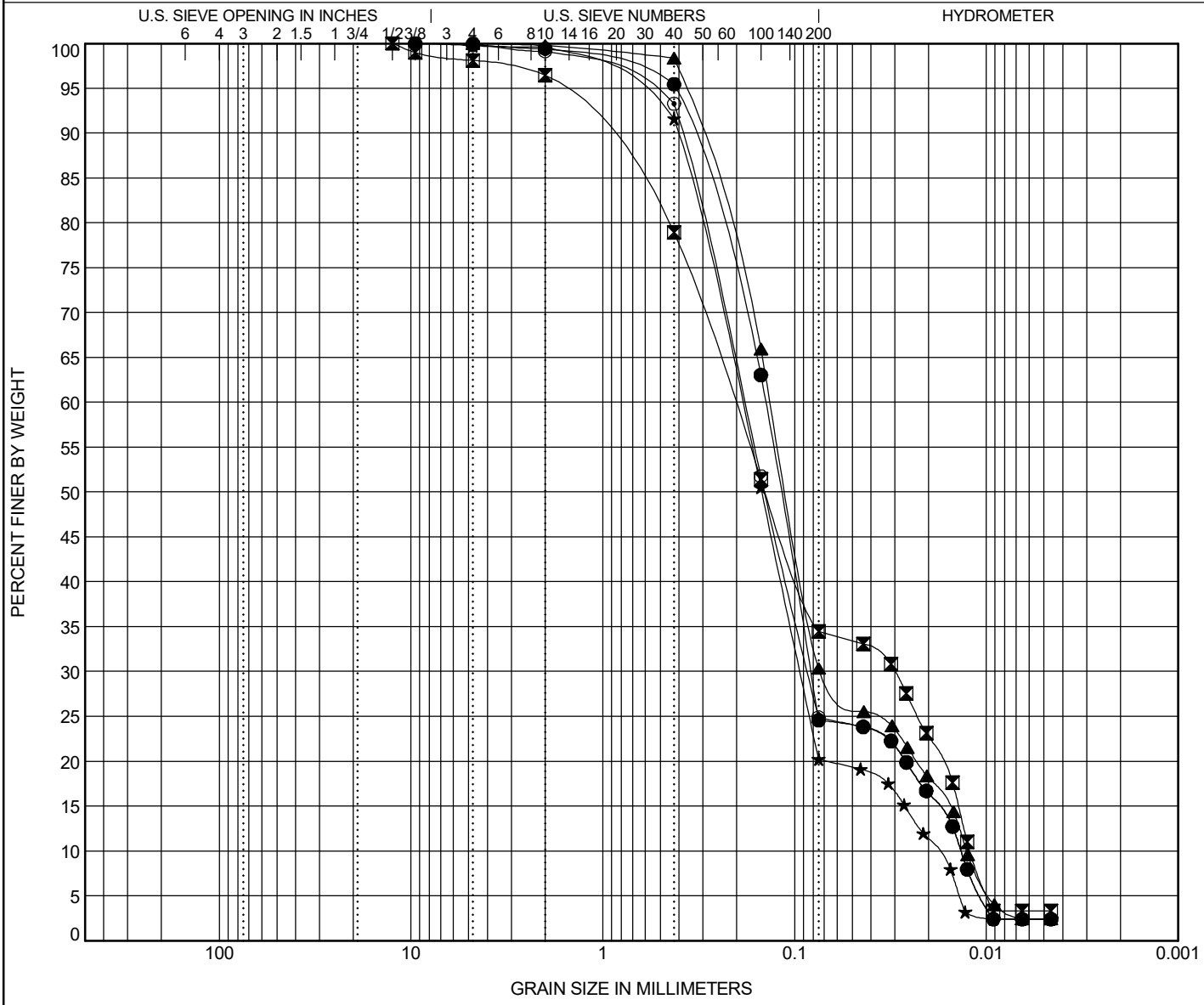
GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-060-0-22	4.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-061-0-22	1.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-061-0-22	2.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP
★	B-062-0-22	1.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊙	B-062-0-22	2.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP

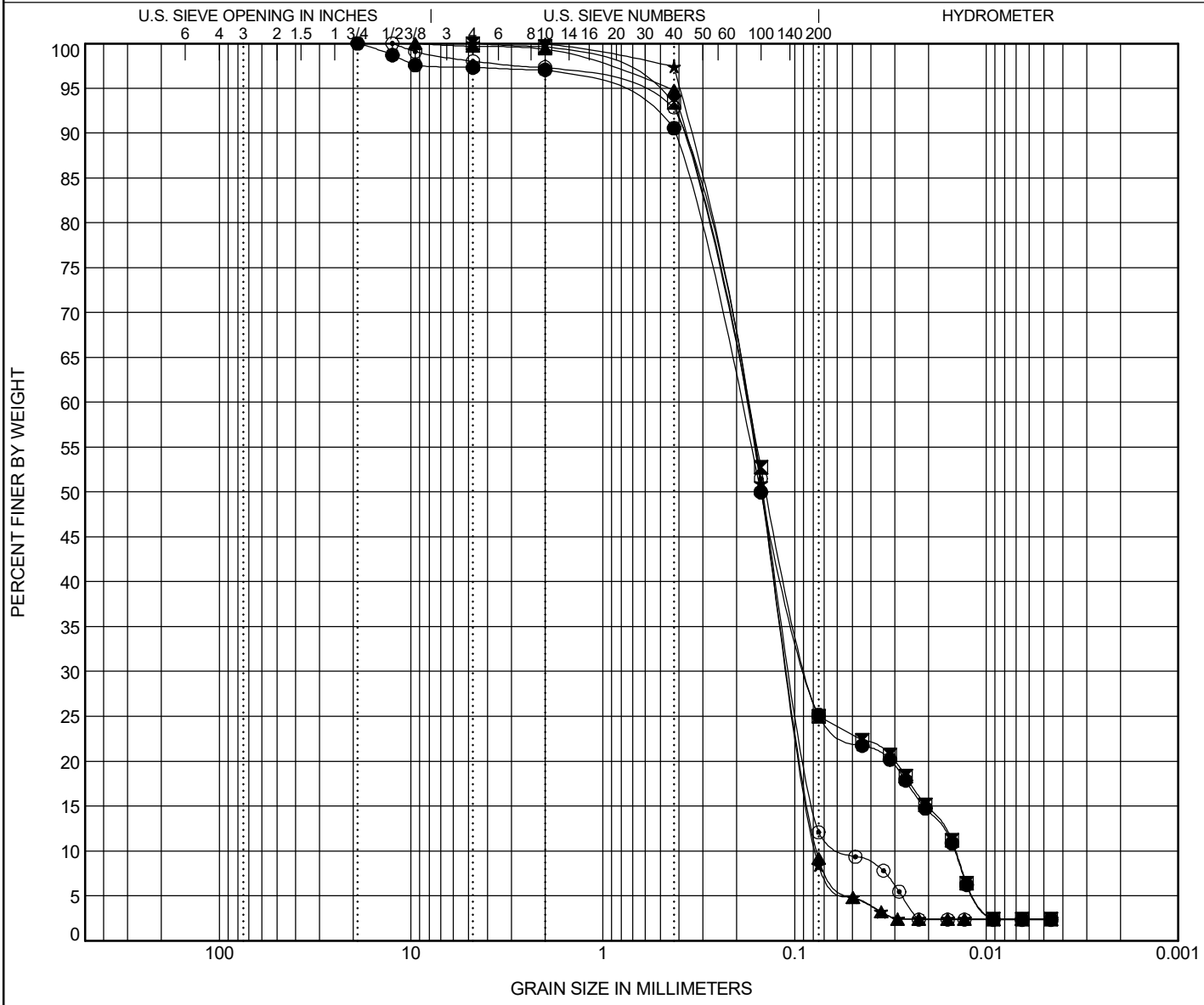
Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-060-0-22	4.0	0.357	0.119	0.083	0.014	0	4	71	23	2	3.55	10.46
⊠	B-061-0-22	1.0	1.13	0.142	0.03	0.012	4	17	45	31	3	0.36	17.18
▲	B-061-0-22	2.5	0.325	0.11	0.072	0.013	1	1	68	28	2	3.08	10.53
★	B-062-0-22	1.0	0.408	0.148	0.094	0.018	1	8	71	18	2	2.54	10.50
⊙	B-062-0-22	2.5	0.391	0.143	0.086	0.014	1	6	68	23	2	2.92	13.57

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-063-0-22	1.0	A-3a ~ SILTY SAND(SM)	NP	NP	NP
⊠	B-063-0-22	2.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP
▲	B-064-0-22	1.5	A-3 ~ POORLY GRADED SAND with SILT(SP-SM)	NP	NP	NP
★	B-064-0-22	3.0	A-3 ~ POORLY GRADED SAND with SILT(SP-SM)	NP	NP	NP
⊙	B-065-0-22	1.5	A-3a ~ SILTY SAND(SM)	NP	NP	NP

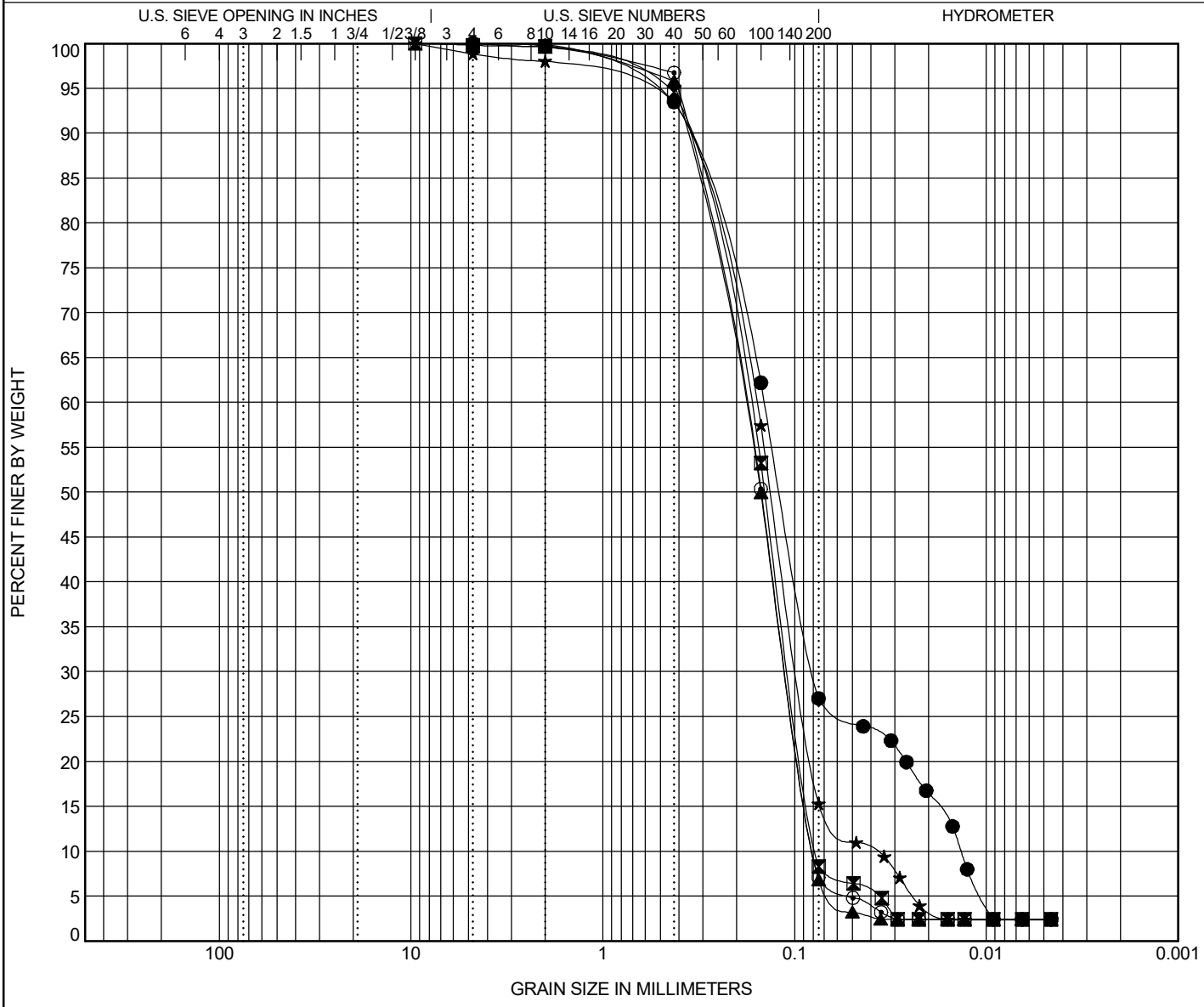
Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-063-0-22	1.0	0.419	0.15	0.086	0.015	3	7	65	23	2	2.60	13.26
⊠	B-063-0-22	2.5	0.39	0.14	0.085	0.014	1	6	68	23	2	2.76	12.48
▲	B-064-0-22	1.5	0.38	0.149	0.106	0.076	0	5	86	7	2	0.79	2.46
★	B-064-0-22	3.0	0.36	0.148	0.107	0.077	1	2	89	6	2	0.80	2.39
⊙	B-065-0-22	1.5	0.395	0.146	0.103	0.054	3	4	81	10	2	1.06	3.46

GRAIN SIZE DISTRIBUTION

OHIO DEPARTMENT OF TRANSPORTION
OFFICE OF GEOTECHNICAL ENGINEERING

PROJECT HEN-109-06.00 **PID** 95741

OGE NUMBER N/A **PROJECT TYPE** ROADWAY



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			ODOT (Modified AASHTO) ~ USCS Classification	LL	PL	PI
●	B-065-0-22	3.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊠	B-066-0-22	1.5	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
▲	B-066-0-22	3.0	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**
★	B-067-0-22	1.0	**A-3a ~ SILTY SAND(SM)**	**NP**	**NP**	**NP**
⊙	B-067-0-22	2.5	**A-3 ~ POORLY GRADED SAND with SILT(SP-SM)**	**NP**	**NP**	**NP**

Specimen Identification			D90	D50	D30	D10	%G	%CS	%FS	%M	%C	Cc	Cu
●	B-065-0-22	3.0	**0.379**	**0.118**	**0.08**	**0.014**	**1**	**6**	**66**	**25**	**2**	**3.25**	**10.59**
⊠	B-066-0-22	1.5	**0.379**	**0.143**	**0.105**	**0.077**	**1**	**5**	**86**	**6**	**2**	**0.80**	**2.31**
▲	B-066-0-22	3.0	**0.373**	**0.15**	**0.109**	**0.079**	**0**	**4**	**89**	**5**	**2**	**0.80**	**2.39**
★	B-067-0-22	1.0	**0.384**	**0.133**	**0.096**	**0.039**	**2**	**5**	**78**	**13**	**2**	**1.46**	**4.16**
⊙	B-067-0-22	2.5	**0.365**	**0.149**	**0.108**	**0.079**	**0**	**3**	**90**	**5**	**2**	**0.80**	**2.37**

GRAIN SIZE - OH DOT.GDT - 1/17/23 12:14 - S:\PROJECTS\2223901.GPJ

Appendix A:
Engineering Calculations
(Including GB-1 Spreadsheets)

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

Instructions: Enter data in the shaded cells only.
(Enter state route number, project description,county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

HEN-109-06.00
95741

Full-Depth Roadway Reconstruction (1 of 2) - South Segment, approximately 2⅓ miles in length, from SR 18 to Ash Run in Henry County, Ohio

TTL Associates, Inc.

Prepared By: Luke G. Holmes, EIT
Date prepared: Wednesday, February 8, 2023

Luke G. Holmes, EIT
1915 North 12th Street
Toledo, OH 43604-5305

(419) 304-6482
lholmes@ttlassoc.com

NO. OF BORINGS: 34

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-22	HEN 109 CL				CME 550x ATV \07	78	699.9	698.5	1.4 C
2	B-002-0-22	HEN 109 CL				CME 550x ATV \07	78	699.2	697.8	1.4 C
3	B-003-0-22	HEN 109 CL				CME 550x ATV \07	78	698.9	697.5	1.4 C
4	B-004-0-22	HEN 109 CL				CME 550x ATV \07	78	699.5	698.1	1.4 C
5	B-005-0-22	HEN 109 CL				CME 550x ATV \07	78	698.9	697.5	1.4 C
6	B-006-0-22	HEN 109 CL				CME 550x ATV \07	78	699.2	697.8	1.4 C
7	B-007-0-22	HEN 109 CL				CME 550x ATV \07	78	698.9	697.5	1.4 C
8	B-008-0-22	HEN 109 CL				CME 550x ATV \07	78	697.4	696.0	1.4 C
9	B-001-0-94	HEN 109 CL				HISTORIC RIG	60	699.8	698.4	1.4 C
10	B-002-0-94	HEN 109 CL				HISTORIC RIG	60	699.6	698.2	1.4 C
11	B-009-0-22	HEN 109 CL				CME 550x ATV \07	78	696.8	695.4	1.4 C
12	B-010-0-22	HEN 109 CL				CME 550x ATV \07	78	697.7	696.3	1.4 C
13	B-011-0-22	HEN 109 CL				CME 550x ATV \07	78	697.1	695.7	1.4 C
14	B-012-0-22	HEN 109 CL				CME 550x ATV \07	78	696.4	695.0	1.4 C
15	B-013-0-22	HEN 109 CL				CME 550x ATV \07	78	696.1	694.7	1.4 C
16	B-014-0-22	HEN 109 CL				CME 550x ATV \07	78	696.0	694.6	1.4 C
17	B-015-0-22	HEN 109 CL				CME 550x ATV \07	78	696.0	694.6	1.4 C
18	B-016-0-22	HEN 109 CL				CME 550x ATV \07	78	695.1	693.7	1.4 C
19	B-017-0-22	HEN 109 CL				CME 550x ATV \07	78	694.7	693.3	1.4 C
20	B-018-0-22	HEN 109 CL				CME 550x ATV \07	78	694.4	693.0	1.4 C
21	B-019-0-22	HEN 109 CL				CME 550x ATV \07	78	694.8	693.4	1.4 C
22	B-020-0-22	HEN 109 CL				CME 550x ATV \07	78	694.1	692.7	1.4 C
23	B-021-0-22	HEN 109 CL				CME 550x ATV \07	78	694.3	692.9	1.4 C
24	B-022-0-22	HEN 109 CL				CME 550x ATV \07	78	693.4	692.0	1.4 C
25	B-023-0-22	HEN 109 CL				CME 550x ATV \07	78	693.9	692.5	1.4 C
26	B-024-0-22	HEN 109 CL				CME 550x ATV \07	78	693.5	692.1	1.4 C
27	B-025-0-22	HEN 109 CL				CME 550x ATV \07	78	692.8	691.4	1.4 C
28	B-026-0-22	HEN 109 CL				CME 550x ATV \07	78	692.9	691.5	1.4 C
29	B-027-0-22	HEN 109 CL				CME 550x ATV \07	78	692.9	691.5	1.4 C
30	B-028-0-22	HEN 109 CL				CME 550x ATV \07	78	692.2	690.8	1.4 C
31	B-029-0-22	HEN 109 CL				CME 550x ATV \07	78	691.5	690.1	1.4 C
32	B-030-0-22	HEN 109 CL				CME 550x ATV \07	78	691.5	690.1	1.4 C
33	B-031-0-22	HEN 109 CL				CME 550x ATV \07	78	690.4	689.0	1.4 C
34	B-032-0-22	HEN 109 CL				CME 550x ATV \07	78	689.5	688.1	1.4 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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-1A	1.2	2.0	-0.2	0.6	12		2.5	50	31	19	26	45	71	23		A-7-5	13	310	A-7-5		7"		15"
	001-0	SS-1B	2.0	2.5	0.6	1.1	10										18	A-7-6	16			N_{60}		12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	7		2.75	45	21	24	28	56	84	26	18	A-7-6	15			N_{60} & Mc			
		SS-3	4.0	5.5	2.6	4.1	5	5	2.25							21	18	A-7-6	16						
2	B	SS-1A	1.3	2.0	-0.1	0.6	7		4.5	39	23	16	29	45	74	20	18	A-6b	10			N_{60}		15"	15"
	002-0	SS-1B	2.0	2.5	0.6	1.1	8										18	A-7-6	16			N_{60}		12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	7		2	46	24	22	31	52	83	25	21	A-7-6	14	300		N_{60} & Mc			
		SS-3	4.0	5.5	2.6	4.1	5	5	1							26	18	A-7-6	16						
3	B	SS-1	1.4	2.0	0.0	0.6	9		4.25	42	25	17	28	44	72	20	22	A-7-6	11	310		N_{60}		12"	12"
	003-0	SS-2	2.0	4.0	0.6	2.6	8		2.25							25	18	A-7-6	16			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		3	45	24	21	24	47	71	28	21	A-7-6	13						
		SS-4	5.5	7.0	4.1	5.6	12	8	2.5							23	18	A-7-6	16						
4	B	SS-1A	1.3	2.0	-0.1	0.6	10		4.5	38	21	17	28	51	79	18	16	A-6b	11			N_{60}		12"	12"
	004-0	SS-1B	2.0	2.5	0.6	1.1	10										18	A-7-6	16			N_{60}		12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	12		3.5	46	23	23	27	55	82	24	20	A-7-6	14	300		N_{60} & Mc			
		SS-3	4.0	5.5	2.6	4.1	7	7	2.5							22	18	A-7-6	16						
5	B	SS-1	1.3	2.0	-0.1	0.6	10		3	44	22	22	25	43	68	22	19	A-7-6	12	300		N_{60} & Mc		12"	8"
	005-0	SS-2	2.0	4.0	0.6	2.6	12		3.75	46	23	23	28	53	81	20	20	A-7-6	14						204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	16		2.75							19	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	12	10	4.25							17	18	A-7-6	16						
6	B	SS-1	1.3	2.5	-0.1	1.1	9		2.75	44	22	22	27	52	79	21	19	A-7-6	14	310		N_{60}		12"	12"
	006-0	SS-2	2.5	4.0	1.1	2.6	10		2.5							24	18	A-7-6	16			N_{60} & Mc			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		3	43	22	21	26	56	82	25	19	A-7-6	13						
		SS-4	5.5	7.0	4.1	5.6	8	8	1							26	18	A-7-6	16						
7	B	SS-1	1.3	2.5	-0.1	1.1	9		3	47	23	24	24	56	80	21	20	A-7-6	15	310		N_{60}		12"	12"
	007-0	SS-2	2.5	4.0	1.1	2.6	9		4							20	18	A-7-6	16			N_{60}			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	18		4.5	38	22	16	20	59	79	17	17	A-6b	10						
		SS-4	5.5	7.0	4.1	5.6	21	9	4.5							15	16	A-6b	16						
8	B	SS-1	1.3	2.5	-0.1	1.1	10									20	16	A-6b	16			N_{60} & Mc		12"	12"
	008-0	SS-2	2.5	4.0	1.1	2.6	9		2.5	39	23	16	22	46	68	24	18	A-6b	9	300		N_{60} & Mc			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	7		1	42	23	19	21	56	77	31	20	A-7-6	12						
		SS-4	5.5	7.0	4.1	5.6	10	7	3.25							18	18	A-7-6	16						
9	B	SS-1	1.4	2.5	0.0	1.1	14			43	24	19	40	34	74	36	21	A-7-6	12			N_{60} & Mc		12"	12"
	001-0	SS-2	2.5	6.5	1.1	5.1	12			41	19	22	32	45	77	18	18	A-7-6	13						204 Geotextile
	94																								
								12																	

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
10	B	SS-16	1.4	2.5	0.0	1.1	16			33	18	15	36	43	79	15	14	A-6a	10						0"
	002-0	SS-17	2.5	6.5	1.1	5.1	16			44	24	20	33	47	80	20	21	A-7-6	13						
	94																								
								16																	
11	B	SS-1A	1.5	2.0	0.1	0.6	10		1.75	37	19	18	21	45	66	19	16	A-6b	9	300		HP & Mc		12"	12"
	009-0	SS-1B	2.0	2.5	0.6	1.1	10										18	A-7-6	16			N_{60}		12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	10		1	41	21	20	28	52	80	22	18	A-7-6	12			HP & Mc			
		SS-3	4.0	5.5	2.6	4.1	8	8	2.5							21	18	A-7-6	16						
12	B	SS-1	1.3	2.0	-0.1	0.6	12		1.75	42	21	21	24	49	73	20	18	A-7-6	12						12"
	010-0	SS-2	2.0	4.0	0.6	2.6	8		3	43	22	21	27	50	77	21	19	A-7-6	13	300		N_{60}		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	9		4.5							17	16	A-6b	16						
		SS-4	5.5	7.0	4.1	5.6	20	8	3.75							16	16	A-6b	16						
13	B	SS-1	1.3	2.5	-0.1	1.1	10		4.5	39	20	19	25	45	70	19	16	A-6b	11	300		N_{60} & Mc		12"	12"
	011-0	SS-2	2.5	4.0	1.1	2.6	8		3.5	39	19	20	23	52	75	20	16	A-6b	12			N_{60} & Mc			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	5		1.5							23	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	17	5	4.5							16	16	A-6b	16						
14	B	SS-1	1.3	2.5	-0.1	1.1	9		4.25	43	21	22	26	47	73	21	18	A-7-6	13			N_{60} & Mc		12"	12"
	012-0	SS-2	2.5	4.0	1.1	2.6	9		2.5	44	22	22	26	53	79	25	19	A-7-6	14	310		N_{60} & Mc			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	8		4							23	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	8	8	3.25							22	18	A-7-6	16						
15	B	SS-1	1.5	2.0	0.1	0.6	8		3.5	44	21	23	27	51	78	26	18	A-7-6	14	310		N_{60} & Mc		12"	12"
	013-0	SS-2	2.0	4.0	0.6	2.6	8		2.75	43	22	21	27	51	78	24	19	A-7-6	13			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	5		2							26	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	7	5	0.5							24	18	A-7-6	16						
16	B	SS-1A	1.5	2.0	0.1	0.6	8		4.25	39	20	19	28	48	76	21	16	A-6b	12			N_{60} & Mc		12"	12"
	014-0	SS-2	2.0	4.0	0.6	2.6	8		2.5	41	21	20	26	53	79	28	18	A-7-6	12	300		N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	8		3.25							22	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	9	8	0.75							22	18	A-7-6	16						
17	B	SS-1	1.3	2.0	-0.1	0.6	12		3.5	47	25	22	20	51	71	24	22	A-7-6	13	250					12"
	015-0	SS-2	2.0	4.0	0.6	2.6	9		2.75							21	18	A-7-6	16			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		2	42	20	22	23	61	84	29	18	A-7-6	13						
		SS-4	5.5	7.0	4.1	5.6	5	5	0.5							32	18	A-7-6	16						
18	B	SS-1	1.5	2.5	0.1	1.1	9		3.75	47	25	22	22	61	83	23	22	A-7-6	14	260		N_{60}		12"	12"
	016-0	SS-2	2.5	4.0	1.1	2.6	8		3	48	25	23	26	50	76	24	22	A-7-6	15			N_{60}			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	7		3							23	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	7	7	2							23	18	A-7-6	16						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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	B	SS-1	1.3	2.0	-0.1	0.6	8		3.75	48	25	23	26	45	71	27	22	A-7-6	14			N_{60} & Mc			12"	12"
	017-0	SS-2	2.0	4.0	0.6	2.6	12		4	46	23	23	24	53	77	23	20	A-7-6	14	260		N_{60} & Mc			12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	9		3.25							22	18	A-7-6	16							
		SS-4	5.5	7.0	4.1	5.6	17	8	4.5							11	16	A-6b	16							
20	B	SS-1A	1.3	2.0	-0.1	0.6	13			NP	NP	NP	30	6	36	16	11	A-4a	0	100		N_{60} & Mc			12"	12"
	018-0	SS-1B	2.0	2.5	0.6	1.1	10										18	A-7-6	16			N_{60}			12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	8		4.5	47	23	24	44	19	63	17	20	A-7-6	12			N_{60}				
		SS-3	4.0	5.5	2.6	4.1	9	8	3							21	18	A-7-6	16							
21	B	SS-1A	1.3	2.0	-0.1	0.6	13		2.5	37	19	18	31	10	41	14	16	A-6b	3							15"
	019-0	SS-1B	2.0	2.5	0.6	1.1	8										18	A-7-6	16			N_{60}			12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	7		2.75	42	21	21	26	49	75	23	18	A-7-6	13	260		N_{60} & Mc				
		SS-3	4.0	5.5	2.6	4.1	9	7	1.75							23	18	A-7-6	16							
22	B	SS-1	1.3	2.5	-0.1	1.1	12		1.5	42	22	20	24	42	66	21	19	A-7-6	11	260		HP			12"	12"
	020-0	SS-2	2.5	4.0	1.1	2.6	14		3	43	22	21	21	55	76	19	19	A-7-6	13							204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	8		2							20	16	A-6b	16							
		SS-4	5.5	7.0	4.1	5.6	12	8	4.5							16	16	A-6b	16							
23	B	SS-1A	1.2	2.0	-0.2	0.6	10		4.5	36	16	20	18	29	47	18	16	A-6b	6	260		N_{60}			12"	12"
	021-0	SS-1B	2.0	2.5	0.6	1.1	10										18	A-7-6	16			N_{60}			12"	204 Geotextile
	22	SS-2	2.5	4.0	1.1	2.6	13		2	43	20	23	23	58	81	23	18	A-7-6	14			N_{60} & Mc				
		SS-3	4.0	5.5	2.6	4.1	7	7	4.5							19	16	A-6b	16							
24	B	SS-1	1.3	2.5	-0.1	1.1	12		4.5							14	16	A-6b	16							0"
	022-0	SS-2	2.5	4.0	1.1	2.6	10		4.5	37	20	17	19	37	56	13	16	A-6b	7	270		N_{60}				
	22	SS-3	4.0	5.5	2.6	4.1	8		2.75	44	22	22	20	61	81	22	19	A-7-6	14							
		SS-4	5.5	7.0	4.1	5.6	14	8	4.5							16	16	A-6b	16							
25	B	SS-1	1.3	2.0	-0.1	0.6	10		3.5	41	20	21	20	31	51	18	18	A-7-6	7			N_{60}			12"	12"
	023-0	SS-2	2.0	4.0	0.6	2.6	9		3	43	21	22	19	63	82	24	18	A-7-6	13	290		N_{60} & Mc			12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	7		4.5							19	16	A-6b	16							
		SS-4	5.5	7.0	4.1	5.6	10	7	2.5							22	18	A-7-6	16							
26	B	SS-1	1.3	2.0	-0.1	0.6	14		2.5	41	20	21	17	43	60	23	18	A-7-6	10	290		N_{60} & Mc			12"	12"
	024-0	SS-2	2.0	4.0	0.6	2.6	9		2.5	45	23	22	22	51	73	19	20	A-7-6	13			N_{60}			12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		4.5							13	18	A-7-6	16							
		SS-4	5.5	7.0	4.1	5.6	9	9	1.25							23	18	A-7-6	16							
27	B	SS-1	1.3	2.0	-0.1	0.6	9		3.5	41	20	21	23	22	45	17	18	A-7-6	5			N_{60}			12"	12"
	025-0	SS-2	2.0	4.0	0.6	2.6	8		3.25	44	22	22	29	47	76	22	19	A-7-6	14	300		N_{60} & Mc			12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	8		2.75							26	18	A-7-6	16							
		SS-4	5.5	7.0	4.1	5.6	12	8	4.5							17	16	A-6b	16							

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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	1.3	2.0	-0.1	0.6	12		3.75	45	23	22	27	44	71	26	20	A-7-6	13	280		N_{60} & Mc		12"	12"
	026-0	SS-2	2.0	4.0	0.6	2.6	9		2.25	44	22	22	28	45	73	27	19	A-7-6	13			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		3.25							20	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	16	9	4.5							18	16	A-6b	16						
29	B	SS-1	1.3	2.0	-0.1	0.6	8		2.75	47	21	26	26	50	76	23	18	A-7-6	16	280		N_{60} & Mc		12"	8"
	027-0	SS-2	2.0	4.0	0.6	2.6	13		3.5	41	20	21	30	9	39	15	18	A-7-6	3						204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	16		2.75							25	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	5	5	1.5							31	18	A-7-6	16						
30	B	SS-1	1.3	2.5	-0.1	1.1	10		0.75	42	21	21	19	29	48	17	18	A-7-6	6	290		HP		18"	14"
	028-0	SS-2	2.5	4.0	1.1	2.6	10		4.5	43	21	22	28	47	75	18	18	A-7-6	13			N_{60}			204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	9		2.25							21	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	14	9	4.5							17	16	A-6b	16						
31	B	SS-1A	1.3	2.0	-0.1	0.6	9									5		UCF				N_{60}		12"	12"
	029-0	SS-2	2.0	4.0	0.6	2.6	9		3.5	44	22	22	25	48	73	21	19	A-7-6	13			N_{60}		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	7		3.75	44	23	21	26	52	78	21	20	A-7-6	13	290					
		SS-4	5.5	7.0	4.1	5.6	9	7	1.5							21	18	A-7-6	16						
32	B	SS-1	1.3	2.0	-0.1	0.6	9		4.25	42	20	22	26	49	75	21	18	A-7-6	13	300		N_{60} & Mc		12"	12"
	030-0	SS-2	2.0	4.0	0.6	2.6	10		3.5	43	21	22	23	57	80	21	18	A-7-6	13			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	10		3							19	16	A-6b	16						
		SS-4	5.5	7.0	4.1	5.6	7	7	1.25							21	18	A-7-6	16						
33	B	SS-1	1.4	2.0	0.0	0.6	10		2.25	41	20	21	21	61	82	22	18	A-7-6	13	310		N_{60} & Mc		12"	12"
	031-0	SS-2	2.0	4.0	0.6	2.6	10		3.25	42	20	22	24	58	82	20	18	A-7-6	13			N_{60}		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	13		2.5							20	18	A-7-6	16						
		SS-4	5.5	7.0	4.1	5.6	14	10	4.5							18	16	A-6b	16						
34	B	SS-1	1.3	2.0	-0.1	0.6	12		2.25	45	22	23	22	55	77	19	19	A-7-6	14	300					12"
	032-0	SS-2	2.0	4.0	0.6	2.6	10		3.5	44	21	23	20	68	88	21	18	A-7-6	14			N_{60} & Mc		12"	204 Geotextile
	22	SS-3	4.0	5.5	2.6	4.1	13		4.25							19	16	A-6b	16						
		SS-4	5.5	7.0	4.1	5.6	10	10	0.5							27	18	A-7-6	16						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

PID: 95741

County-Route-Section: HEN-109-06.00
No. of Borings: 34

Geotechnical Consultant: TTL Associates, Inc.
Prepared By: Luke G. Holmes, EIT
Date prepared: 2/8/2023

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	No
	Lime Stabilization	Option
206	Depth	14"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L):	12"
Average(HP):	0"
Global Geogrid Average(N60L):	0"
Average(HP):	0"

Design CBR	5

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	5%	HP ≤ 0.5	2%
$N_{60} < 12$	72%	0.5 < HP ≤ 1	5%
$12 \leq N_{60} < 15$	21%	1 < HP ≤ 2	11%
$N_{60} \geq 20$	2%	HP > 2	71%
M+	27%		
Rock	0%		
Unsuitable	1%		

Excavate and Replace at Surface	
Average	11"
Maximum	15"
Minimum	0"

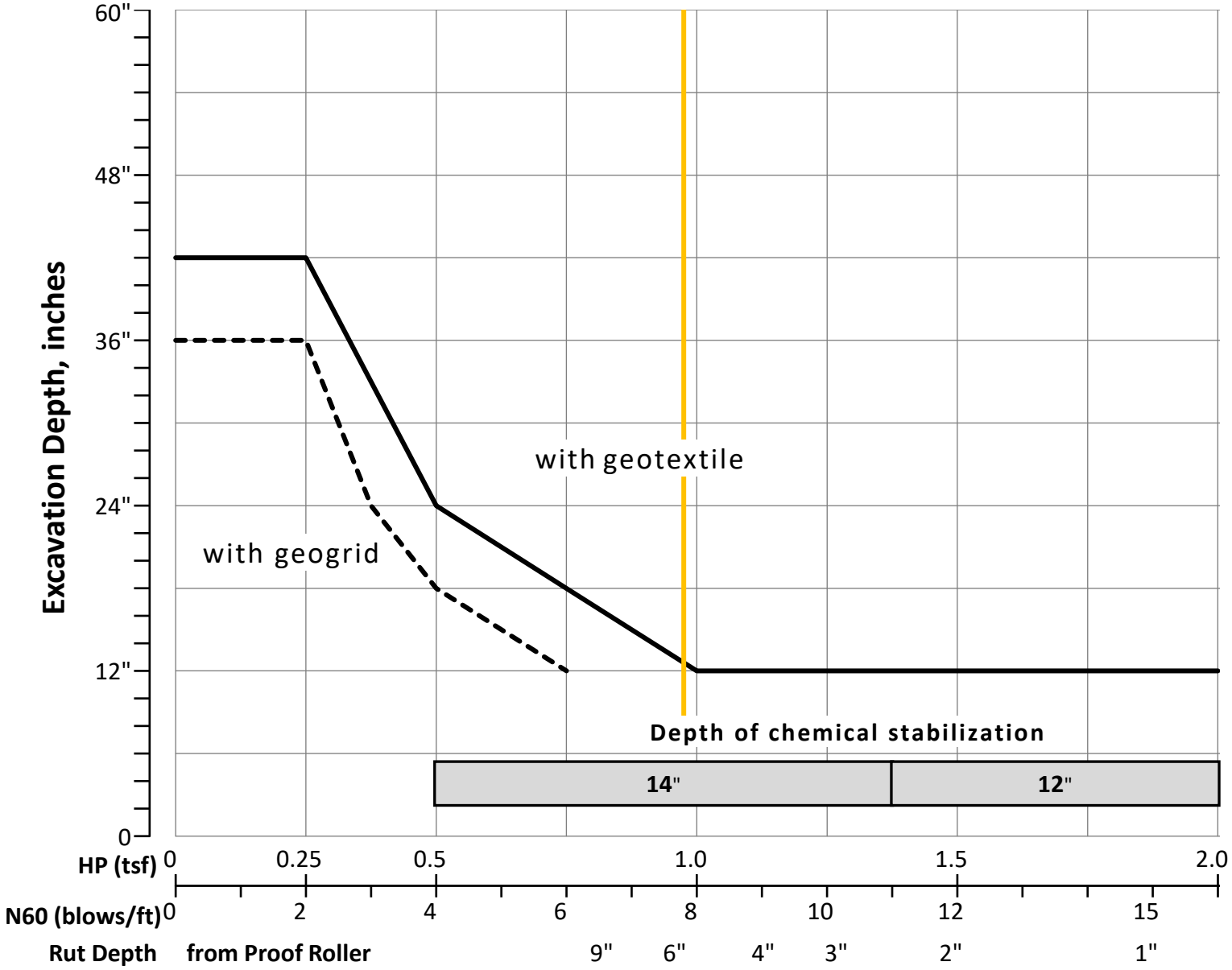
% Proposed Subgrade Surface	
Unstable & Unsuitable	60%
Unstable	59%
Unsuitable	1%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	10	8	3.02	43	22	21	26	47	73	21	18	14
Maximum	21	16	4.50	50	31	26	44	68	88	36	22	16
Minimum	5	5	0.50	33	16	15	17	6	36	5	11	0

Classification Counts by Sample

ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	0	0	0	0	0	0	0	0	1	0	0	1	29	1	99	0	0	131
Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	22%	1%	76%	0%	0%	100%
% Rock|Granular|Cohesive	0%	1%									99%								100%
Surface Class Count	0	0	0	0	0	0	0	0	0	1	0	0	1	19	1	84	0	0	106
Surface Class Percent	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	18%	1%	79%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.02		☐ HP
7.88		☐ N60L

Average HP
Average N_{60L}

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

Instructions: Enter data in the shaded cells only.
(Enter state route number, project description,county, consultant's name, prepared by name, and date prepared. This information will be transferred to all other sheets. The date prepared must be entered in the appropriate cell on this sheet to remove these instructions prior to printing.)

HEN-109-06.00
95741

Full-Depth Roadway Reconstruction (2 of 2) - North Segment, approximately 2½ miles from Liberty Center to Twp Hwy W in Henry County, Ohio

TTL Associates, Inc.

Prepared By: Luke G. Holmes, EIT
Date prepared: Tuesday, February 7, 2023

Luke G. Holmes, EIT
1915 North 12th Street
Toledo, OH 43604-5305

(419) 304-6482
lholmes@ttlassoc.com

NO. OF BORINGS: 35

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-033-0-22	HEN 109 CL				CME 550x ATV \07	78	679.3	677.9	1.4 C
2	B-034-0-22	HEN 109 CL				CME 550x ATV \07	78	679.1	677.7	1.4 C
3	B-035-0-22	HEN 109 CL				CME 550x ATV \07	78	681.4	680.0	1.4 C
4	B-036-0-22	HEN 109 CL				CME 550x ATV \07	78	680.6	679.2	1.4 C
5	B-037-0-22	HEN 109 CL				CME 550x ATV \07	78	678.6	677.2	1.4 C
6	B-038-0-22	HEN 109 CL				CME 550x ATV \07	78	679.4	678.0	1.4 C
7	B-039-0-22	HEN 109 CL				CME 550x ATV \07	78	679.8	678.4	1.4 C
8	B-040-0-22	HEN 109 CL				CME 550x ATV \07	78	680.5	679.1	1.4 C
9	B-041-0-22	HEN 109 CL				CME 550x ATV \07	78	681.8	680.4	1.4 C
10	B-042-0-22	HEN 109 CL				CME 550x ATV \07	78	680.6	679.2	1.4 C
11	B-043-0-22	HEN 109 CL				CME 550x ATV \07	78	679.8	678.4	1.4 C
12	B-044-0-22	HEN 109 CL				CME 550x ATV \07	78	680.6	679.2	1.4 C
13	B-045-0-22	HEN 109 CL				CME 550x ATV \07	78	680.3	678.9	1.4 C
14	B-046-0-22	HEN 109 CL				CME 550x ATV \07	78	680.3	678.9	1.4 C
15	B-047-0-22	HEN 109 CL				CME 550x ATV \07	78	680.4	679.0	1.4 C
16	B-048-0-22	HEN 109 CL				CME 550x ATV \07	78	681.6	680.2	1.4 C
17	B-049-0-22	HEN 109 CL				CME 550x ATV \07	78	681.1	679.7	1.4 C
18	B-050-0-22	HEN 109 CL				CME 550x ATV \07	78	682.4	681.0	1.4 C
19	B-051-0-22	HEN 109 CL				CME 550x ATV \07	78	682.8	681.4	1.4 C
20	B-052-0-22	HEN 109 CL				CME 550x ATV \07	78	682.4	681.0	1.4 C
21	B-053-0-22	HEN 109 CL				CME 550x ATV \07	78	682.0	680.6	1.4 C
22	B-054-0-22	HEN 109 CL				CME 550x ATV \07	78	682.8	681.4	1.4 C
23	B-055-0-22	HEN 109 CL				CME 550x ATV \07	78	683.6	682.2	1.4 C
24	B-056-0-22	HEN 109 CL				CME 550x ATV \07	78	684.4	683.0	1.4 C
25	B-057-0-22	HEN 109 CL				CME 550x ATV \07	78	682.2	680.8	1.4 C
26	B-058-0-22	HEN 109 CL				CME 550x ATV \07	78	683.0	681.6	1.4 C
27	B-059-0-22	HEN 109 CL				CME 550x ATV \07	78	680.6	679.2	1.4 C
28	B-060-0-22	HEN 109 CL				CME 550x ATV \07	78	681.1	679.7	1.4 C
29	B-061-0-22	HEN 109 CL				CME 550x ATV \07	78	681.6	680.2	1.4 C
30	B-062-0-22	HEN 109 CL				CME 550x ATV \07	78	684.5	683.1	1.4 C
31	B-063-0-22	HEN 109 CL				CME 550x ATV \07	78	682.7	681.3	1.4 C
32	B-064-0-22	HEN 109 CL				Dietrich D70 Track /01	90	688.1	686.7	1.4 C
33	B-065-0-22	HEN 109 CL				Dietrich D70 Track /01	90	683.3	681.9	1.4 C
34	B-066-0-22	HEN 109 CL				Dietrich D70 Track /01	90	686.3	684.9	1.4 C
35	B-067-0-22	HEN 109 CL				Dietrich D70 Track /01	90	685.1	683.7	1.4 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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-1A	1.5	2.0	0.1	0.6	18										8	A-3a	0						Rework in Place
	033-0	SS-1B	2.0	3.0	0.6	1.6	14			NP	NP	NP	27	2	29	24	8	A-3a	0	0					
	22	SS-2	3.0	4.5	1.6	3.1	8			NP	NP	NP	27	2	29	20	8	A-3a	0						
		SS-3	4.5	6.0	3.1	4.6	10	8								22	8	A-3	0						
2	B	SS-1	2.0	3.5	0.6	2.1	13			NP	NP	NP	25	2	27	14	8	A-3a	0	0					Rework in Place
	034-0	SS-2	3.5	5.0	2.1	3.6	9			NP	NP	NP	30	2	32	19	8	A-3a	0						
	22	SS-3	5.0	6.5	3.6	5.1	7									23	8	A-3	0						
		SS-4	6.5	8.0	5.1	6.6	8	7								26	8	A-3a							
3	B	SS-1	1.5	3.0	0.1	1.6	22			NP	NP	NP	23	2	25	10	8	A-3a	0						Rework in Place
	035-0	SS-2	3.0	4.5	1.6	3.1	14			NP	NP	NP	21	2	23	18	8	A-3a	0	0					
	22	SS-3	4.5	6.0	3.1	4.6	12									19	8	A-3	0						
		SS-4	6.0	7.5	4.6	6.1	13	12								21	8	A-3	0						
4	B	SS-1	1.4	2.9	0.0	1.5	22			NP	NP	NP	20	2	22	13	8	A-3a	0	0					Rework in Place
	036-0	SS-2	2.9	4.4	1.5	3.0	10			NP	NP	NP	15	2	17	19	8	A-3a	0						
	22	SS-3	4.4	5.9	3.0	4.5	7									16	8	A-3a	0						
		SS-4	5.9	7.4	4.5	6.0	13	7								20	8	A-3a	0						
5	B	SS-1	1.5	3.2	0.1	1.8	23			NP	NP	NP	20	2	22	17	8	A-3a	0	0					Rework in Place
	037-0	SS-2	3.2	4.7	1.8	3.3	16			NP	NP	NP	19	2	21	19	8	A-3a	0						
	22	SS-3	4.7	6.4	3.3	5.0	18									23	8	A-3a	0						
		SS-4	6.4	7.7	5.0	6.3	14	14								24	8	A-3a	0						
6	B	SS-1	1.5	3.2	0.1	1.8	9			NP	NP	NP	15	2	17	21	8	A-3a	0						Rework in Place
	038-0	SS-2	3.2	4.7	1.8	3.3	9			NP	NP	NP	21	2	23	20	8	A-3a	0	0					
	22	SS-3	4.7	6.3	3.3	4.9	10									22	8	A-3a	0						
		SS-4	6.3	7.7	4.9	6.3	16	9								23	8	A-3	0						
7	B	SS-1	1.2	2.7	-0.2	1.3	22			NP	NP	NP	12	2	14	16	8	A-3a	0	0					Rework in Place
	039-0	SS-2	2.7	4.2	1.3	2.8	9			NP	NP	NP	15	2	17	19	8	A-3a	0						
	22	SS-3	4.2	5.7	2.8	4.3	18									20	8	A-3	0						
		SS-4	5.7	7.2	4.3	5.8	13	9								19	8	A-3a	0						
8	B	SS-1	1.2	2.5	-0.2	1.1	16			NP	NP	NP	18	2	20	16	8	A-3a	0	140					Rework in Place
	040-0	SS-2	2.5	4.2	1.1	2.8	8			NP	NP	NP	22	2	24	18	8	A-3a	0						
	22	SS-3	4.2	6.0	2.8	4.6	8									19	8	A-3a	0						
		SS-4	6.0	7.2	4.6	5.8	25	8								23	8	A-3a	0						
9	B	SS-1	1.3	2.8	-0.1	1.4	18			NP	NP	NP	16	2	18	10	8	A-3a	0	130					Rework in Place
	041-0	SS-2	2.8	4.3	1.4	2.9	8			NP	NP	NP	18	2	20	18	8	A-3a	0						
	22	SS-3A	4.3	5.0	2.9	3.6	10										8	A-3a	0						
		SS-3B	5.0	5.8	3.6	4.4	16	8								20	8	A-3	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
10	B	SS-1	1.2	2.5	-0.2	1.1	20			NP	NP	NP	15	2	17	12	8	A-3a	0	130					Rework in Place
	042-0	SS-2	2.5	4.2	1.1	2.8	9			NP	NP	NP	31	2	33	19	8	A-3a	0						
	22	SS-3	4.2	5.7	2.8	4.3	4		0.75							27	16	A-6b	16						
		SS-4	5.7	7.1	4.3	5.7	17	4								22	8	A-3a	0						
11	B	SS-1	1.7	2.7	0.3	1.3	18			NP	NP	NP	26	2	28	16	8	A-3a	0	0					Rework in Place
	043-0	SS-2	2.7	4.2	1.3	2.8	10			NP	NP	NP	31	2	33	18	8	A-3a	0						
	22	SS-3	4.2	6.0	2.8	4.6	8									19	8	A-3a	0						
		SS-4	6.0	7.2	4.6	5.8	23	8								24	8	A-3a	0						
12	B	SS-1	1.8	3.0	0.4	1.6	8			NP	NP	NP	27	2	29	15	8	A-3a	0						Rework in Place
	044-0	SS-2	3.0	4.3	1.6	2.9	5			NP	NP	NP	32	3	35	19	8	A-3a	0	0					
	22	SS-3	4.3	5.8	2.9	4.4	4									18	8	A-3a	0						
		SS-4	5.8	7.3	4.4	5.9	17	4								25	8	A-3	0						
13	B	SS-1	1.8	2.5	0.4	1.1	20			NP	NP	NP	30	2	32	19	8	A-3a	0	0					15"
	045-0	SS-2	2.5	4.8	1.1	3.4	7			19	16	3	35	19	54	17	11	A-4a	4			N_{60} & Mc			204 Geotextile
	22	SS-3B	4.8	5.8	3.4	4.4	5		1.75							25	16	A-6b	16						
		SS-4A	5.8	6.6	4.4	5.2	8	5									16	A-6b	16						
14	B	SS-1A	1.0	2.0	-0.4	0.6	13			NP	NP	NP	32	4	36	16	11	A-4a	0	0		N_{60} & Mc		12"	8"
	046-0	SS-2	2.0	4.0	0.6	2.6	10			NP	NP	NP	20	2	22	20	8	A-3a	0						204 Geotextile
	22	SS-3A	4.0	5.0	2.6	3.6	10									20	8	A-3a	0						
		SS-3B	5.0	6.0	3.6	4.6	16	10									8	A-3	0						
15	B	SS-1	1.5	3.0	0.1	1.6	7			NP	NP	NP	26	2	28	21	8	A-3a	0						21"
	047-0	SS-2	3.0	4.5	1.6	3.1	5		2				37	5	42	24	10	A-4a	7	120		N_{60} & Mc			204 Geotextile
	22	SS-3	4.5	6.0	3.1	4.6	8									20	8	A-3a	0						
		SS-4	6.0	7.5	4.6	6.1	7	5								27	8	A-3	0						
16	B	SS-1	1.5	3.0	0.1	1.6	12			NP	NP	NP	31	2	33	21	8	A-3a	0	0					Rework in Place
	048-0	SS-2	3.0	5.0	1.6	3.6	9			NP	NP	NP	31	3	34	20	8	A-3a	0						
	22	SS-3	5.0	6.0	3.6	4.6	5									24	8	A-3a	0						
		SS-4	6.0	7.5	4.6	6.1	17	5								22	8	A-3	0						
17	B	SS-1	1.5	3.0	0.1	1.6	9			NP	NP	NP	27	2	29	29	8	A-3a	0	0					Rework in Place
	049-0	SS-2	3.0	4.5	1.6	3.1	9			NP	NP	NP	26	2	28	16	8	A-3a	0						
	22	SS-3	4.5	6.0	3.1	4.6	12									15	8	A-3	0						
		SS-4	6.0	7.5	4.6	6.1	13	9								24	8	A-3	0						
18	B	SS-1	1.5	3.0	0.1	1.6	14			NP	NP	NP	21	2	23	9	8	A-3a	0	150					Rework in Place
	050-0	SS-2	3.0	4.5	1.6	3.1	9			NP	NP	NP	32	2	34	17	8	A-3a	0						
	22	SS-3	4.5	6.0	3.1	4.6	12									17	8	A-3a	0						
		SS-4	6.0	7.5	4.6	6.1	10	9								24	8	A-3	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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	B	SS-1	1.4	2.5	0.0	1.1	10			NP	NP	NP	17	2	19	11	8	A-3a	0	0					Rework in Place
	051-0	SS-2	2.5	4.4	1.1	3.0	7			NP	NP	NP	23	2	25	15	8	A-3a	0						
	22	SS-3	4.4	6.0	3.0	4.6	7									17	8	A-3a	0						
		SS-4	6.0	7.4	4.6	6.0	13	7								22	8	A-3	0						
20	B	SS-1	1.5	3.0	0.1	1.6	12			NP	NP	NP	13	2	15	11	8	A-3a	0	0					Rework in Place
	052-0	SS-2	3.0	4.5	1.6	3.1	5			NP	NP	NP	30	2	32	18	8	A-3a	0						
	22	SS-3	4.5	6.0	3.1	4.6	10									19	8	A-3	0						
		SS-4	6.0	7.5	4.6	6.1	10	5								28	8	A-3	0						
21	B	SS-1	1.5	3.0	0.1	1.6	17			NP	NP	NP	7	2	9	13	8	A-3	0	110					Rework in Place
	053-0	SS-2	3.0	4.5	1.6	3.1	9			NP	NP	NP	8	2	10	17	8	A-3	0						
	22	SS-3	4.5	6.0	3.1	4.6	7									23	8	A-3a	0						
		SS-4	6.0	7.5	4.6	6.1	10	7								19	8	A-3a	0						
22	B	SS-1	1.4	2.0	0.0	0.6	16									4		UCF							Rework in Place
	054-0	SS-2	2.0	4.0	0.6	2.6	14			NP	NP	NP	15	2	17	12	8	A-3a	0	110					
	22	SS-3	4.0	6.0	2.6	4.6	16			NP	NP	NP	7	2	9	18	8	A-3	0						
		SS-4	6.0	7.0	4.6	5.6	16	14								19	8	A-3a	0						
23	B	SS-1	1.5	2.5	0.1	1.1	13			NP	NP	NP	11	2	13	18	8	A-3a	0	0					Rework in Place
	055-0	SS-2	2.5	4.0	1.1	2.6	7			NP	NP	NP	13	2	15	13	8	A-3a	0						
	22	SS-3	4.0	5.0	2.6	3.6	7									19	8	A-3a	0						
		SS-4	5.0	7.0	3.6	5.6	9	7								20	8	A-3a	0						
24	B	SS-1	1.5	2.5	0.1	1.1	10			NP	NP	NP	8	2	10	6	8	A-3	0	0					Rework in Place
	056-0	SS-2	2.5	4.0	1.1	2.6	9			NP	NP	NP	7	2	9	6	8	A-3	0						
	22	SS-3A	4.0	5.0	2.6	3.6	7										8	A-3	0						
		SS-3B	5.0	5.5	3.6	4.1	5	5								20	8	A-3a	0						
25	B	SS-1	1.5	2.5	0.1	1.1	17			NP	NP	NP	26	3	29	9	8	A-3a	0	0					Rework in Place
	057-0	SS-2	2.5	4.0	1.1	2.6	8			NP	NP	NP	19	2	21	17	8	A-3a	0						
	22	SS-3	4.0	6.0	2.6	4.6	7									19	8	A-3a	0						
		SS-4	6.0	7.0	4.6	5.6	10	7								24	8	A-3a	0						
26	B	SS-1	1.2	2.0	-0.2	0.6	17			NP	NP	NP	10	2	12	6	8	A-3a	0	110					Rework in Place
	058-0	SS-2	2.0	4.0	0.6	2.6	9			NP	NP	NP	8	2	10	9	8	A-3	0						
	22	SS-3	4.0	6.0	2.6	4.6	9									11	8	A-3	0						
		SS-4	6.0	7.0	4.6	5.6	4	4								24	8	A-3a	0						
27	B	SS-1	1.5	2.5	0.1	1.1	13			NP	NP	NP	19	2	21	13	8	A-3a	0	0					Rework in Place
	059-0	SS-2	2.5	4.0	1.1	2.6	7									14	8	A-3a	0						
	22	SS-3	4.0	5.0	2.6	3.6	7			NP	NP	NP	22	2	24	21	8	A-3a	0						
		SS-4	5.0	7.0	3.6	5.6	10	7								26	8	A-3a	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	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	1.5	2.5	0.1	1.1	13										10	A-4a	8						Rework in Place
	060-0	SS-2	2.5	4.0	1.1	2.6	9			NP	NP	NP	23	2	25	20	8	A-3a	0	0					
	22	SS-3	4.0	6.0	2.6	4.6	8			NP	NP	NP	23	2	25	20	8	A-3a	0						
		SS-4	6.0	7.0	4.6	5.6	9	8								29	8	A-3a	0						
29	B	SS-1	1.5	2.5	0.1	1.1	9			NP	NP	NP	31	3	34	20	8	A-3a	0	0					Rework in Place
	061-0	SS-2	2.5	4.0	1.1	2.6	8			NP	NP	NP	28	2	30	17	8	A-3a	0						
	22	SS-3	4.0	6.0	2.6	4.6	8									20	8	A-3	0						
		SS-4	6.0	7.0	4.6	5.6	14	8								23	8	A-3	0						
30	B	SS-1	1.5	2.5	0.1	1.1	14			NP	NP	NP	18	2	20	7	8	A-3a	0	100					Rework in Place
	062-0	SS-2	2.5	4.0	1.1	2.6	7			NP	NP	NP	23	2	25	21	8	A-3a	0						
	22	SS-3	4.0	5.5	2.6	4.1	5									12	8	A-3a	0						
		SS-4	5.5	7.0	4.1	5.6	7	5								19	8	A-3a	0						
31	B	SS-1	1.0	2.5	-0.4	1.1	16			NP	NP	NP	23	2	25	12	8	A-3a	0						Rework in Place
	063-0	SS-2	2.5	4.0	1.1	2.6	14			NP	NP	NP	23	2	25	17	8	A-3a	0	120					
	22	SS-3	4.0	6.0	2.6	4.6	10									15	8	A-3a	0						
		SS-4	6.0	7.0	4.6	5.6	16	10								19	8	A-3	0						
32	B	SS-1	1.8	3.0	0.4	1.6	27			NP	NP	NP	7	2	9	7	8	A-3	0	120					Rework in Place
	064-0	SS-2	3.0	4.5	1.6	3.1	18			NP	NP	NP	6	2	8	8	8	A-3	0						
	22	SS-3	4.5	5.7	3.1	4.3	14									10	8	A-3	0						
		SS-4	5.7	7.0	4.3	5.6	23	14								9	8	A-3	0						
33	B	SS-1	1.5	3.0	0.1	1.6	38			NP	NP	NP	10	2	12	11	8	A-3a	0	0					Rework in Place
	065-0	SS-2	3.0	4.8	1.6	3.4	20			NP	NP	NP	25	2	27	24	8	A-3a	0						
	22	SS-3	4.8	6.0	3.4	4.6	14									15	8	A-3	0						
		SS-4	6.0	7.5	4.6	6.1	29	14								15	8	A-3	0						
34	B	SS-1	1.8	3.0	0.4	1.6	29			NP	NP	NP	6	2	8	5	8	A-3	0	130					Rework in Place
	066-0	SS-2	3.0	4.5	1.6	3.1	20			NP	NP	NP	5	2	7	6	8	A-3	0						
	22	SS-3	4.5	6.0	3.1	4.6	14									11	8	A-3	0						
		SS-4	6.0	7.5	4.6	6.1	15	14								16	8	A-3	0						
35	B	SS-1	1.4	2.5	0.0	1.1	42			NP	NP	NP	13	2	15	7	8	A-3a	0	140					Rework in Place
	067-0	SS-2	2.5	4.0	1.1	2.6	29			NP	NP	NP	5	2	7	9	8	A-3	0						
	22	SS-3	4.0	5.5	2.6	4.1	18									16	8	A-3	0						
		SS-4	5.5	7.0	4.1	5.6	14	14								22	8	A-3	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

PID: 95741

County-Route-Section: HEN-109-06.00
No. of Borings: 35

Geotechnical Consultant: TTL Associates, Inc.
Prepared By: Luke G. Holmes, EIT
Date prepared: 2/7/2023

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	14"

Excavate and Replace Stabilization Options	
Global Geotextile Average(N60L):	12"
Average(HP):	12"
Global Geogrid Average(N60L):	0"
Average(HP):	0"

Design CBR	12

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	7%	HP ≤ 0.5	0%
$N_{60} < 12$	51%	0.5 < HP ≤ 1	1%
$12 \leq N_{60} < 15$	19%	1 < HP ≤ 2	1%
$N_{60} \geq 20$	12%	HP > 2	0%
M+	2%		
Rock	0%		
Unsuitable	0%		

Excavate and Replace at Surface	
Average	15"
Maximum	21"
Minimum	8"

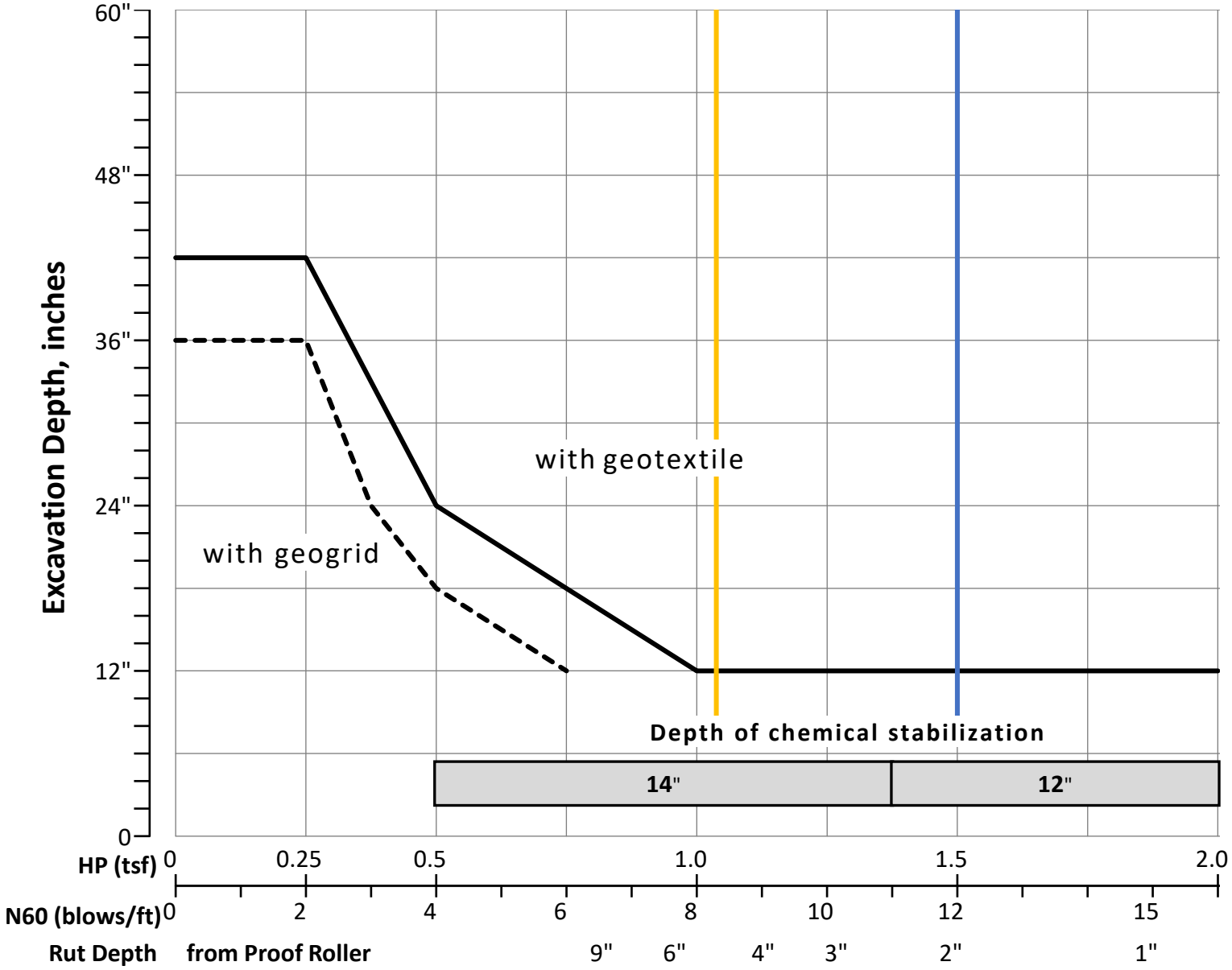
% Proposed Subgrade Surface	
Unstable & Unsuitable	4%
Unstable	4%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	13	8	1.50	19	16	3	20	2	22	18	8	0
Maximum	42	14	2.00	19	16	3	37	19	54	29	16	16
Minimum	4	4	0.75	19	16	3	5	2	7	4	8	0

Classification Counts by Sample

ODOT Class	Rock	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-3	A-3a	A-4a	A-4b	A-5	A-6a	A-6b	A-7-5	A-7-6	A-8a	A-8b	Totals
Count	0	0	0	0	0	0	0	41	91	4	0	0	0	3	0	0	0	0	139
Percent	0%	0%	0%	0%	0%	0%	0%	29%	65%	3%	0%	0%	0%	2%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	98%									2%								100%
Surface Class Count	0	0	0	0	0	0	0	15	63	4	0	0	0	0	0	0	0	0	82
Surface Class Percent	0%	0%	0%	0%	0%	0%	0%	18%	77%	5%	0%	0%	0%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



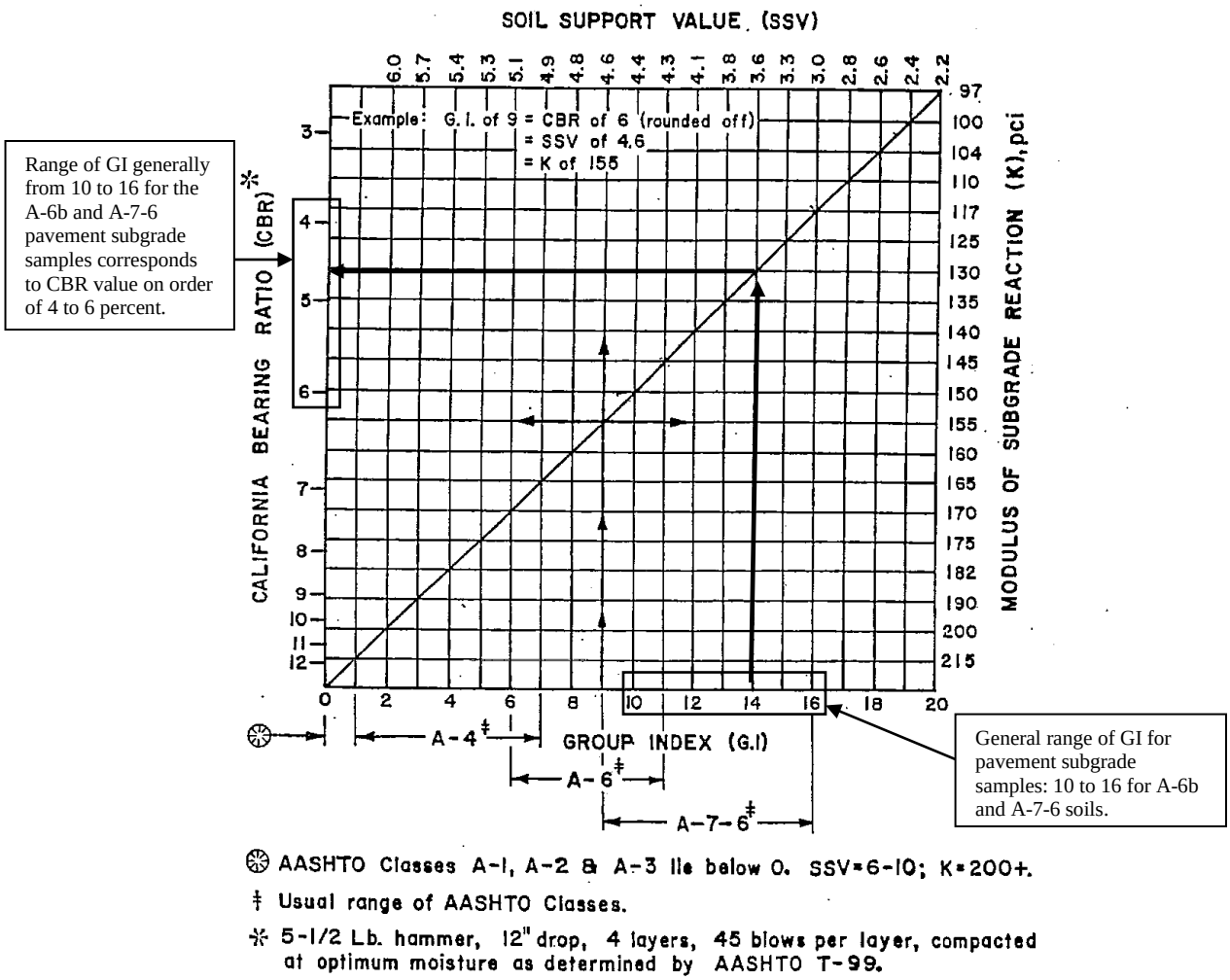
OVERRIDE TABLE

Calculated Average	New Values	Check to Override
1.50		☐ HP
8.31		☐ N60L

Average HP
Average N_{60L}

HEN-109-06.00 (SOUTH SEGMENT)
PID No. 95741

Fig.1301-3
Feb.1978

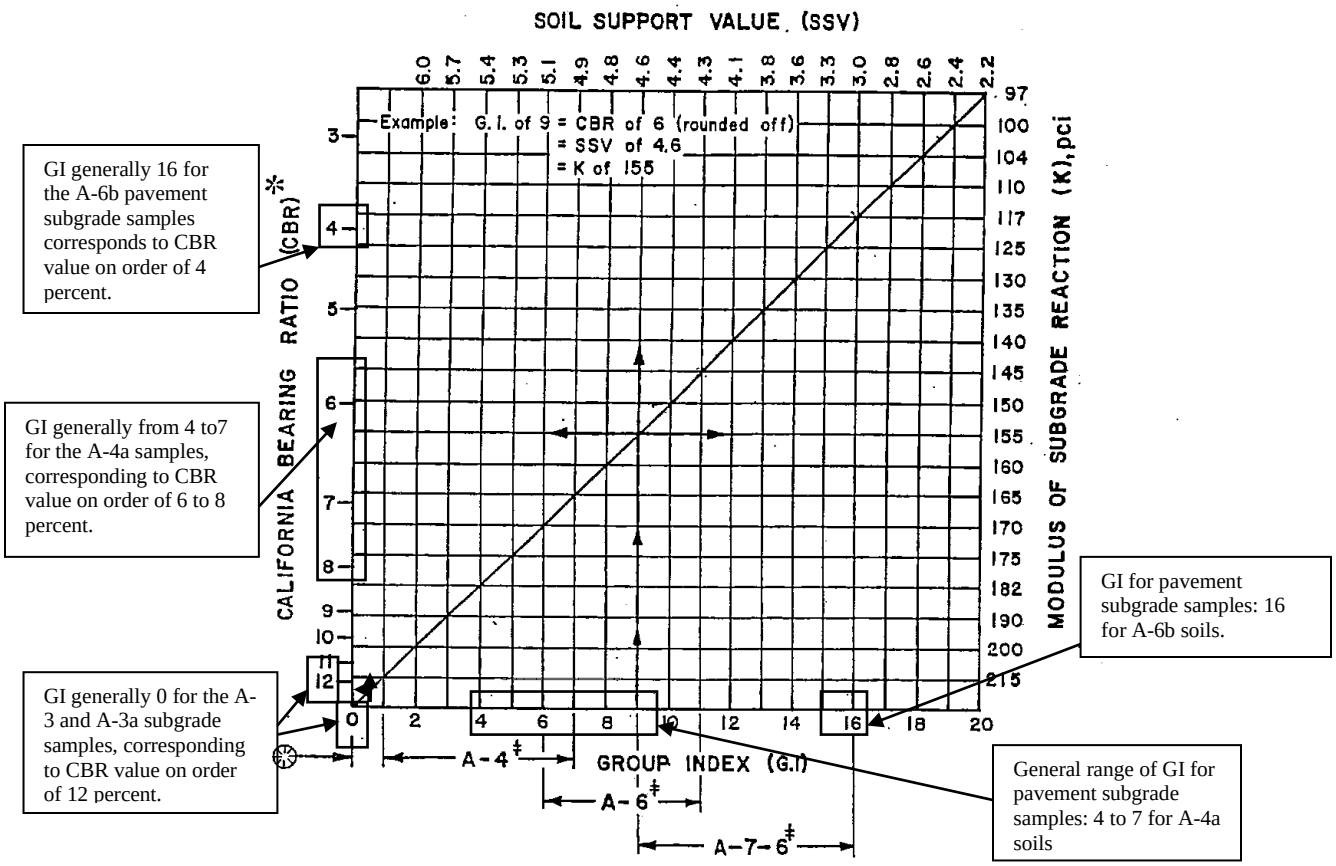


CORRELATION CHART FOR
SUBGRADE STRENGTHS

ODOT GB-1 “Subgrade Analysis” worksheet resulted in a CBR value of 5 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally ranged from 10 to 16, which would correlate with a CBR value of 4 to 6 percent. The higher Group Indices of 15 and 16 that correlate to the lower CBR of 4 percent were only observed in a small percentage of the samples that had laboratory testing performed. These higher Group Indices were primarily assumed by the ODOT GB-1 “Subgrade Analysis” worksheet for the A-6b and A-7-6 soil samples that did not receive lab testing. In any case, 32 borings were recommended for undercut and replacement with granular engineered fill. Of the 2 borings that were not indicated treatment, the Group Indices for the laboratory tested samples were 14 or less, corresponding to a CBR value of 5 percent. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 5 percent for the southern project segment.

HEN-109-06.00 (NORTH SEGMENT)
PID No. 95741

Fig.1301-3
Feb.1978



⊛ AASHTO Classes A-1, A-2 & A-3 lie below 0. SSV=6-10; K=200+.

‡ Usual range of AASHTO Classes.

* 5-1/2 Lb. hammer, 12" drop, 4 layers, 45 blows per layer, compacted at optimum moisture as determined by AASHTO T-99.

CORRELATION CHART FOR
SUBGRADE STRENGTHS

ODOT GB-1 “Subgrade Analysis” worksheet resulted in a CBR value of 12 percent was determined for the project site. It should be noted that the CBR determination by the GB-1 spreadsheet is based on an average Group Index of all the evaluated samples. Group indices for the tested samples generally varied from 0 to 16, which would correlate with a CBR value of 4 to 12 percent. The lower Group Indices associated with the A-3 and A-3a granular soils that were prominent in the borings performed and would correlate with a CBR value of 12 percent. The highest Group Indices associated with the A-6b cohesive soils would correlate with a CBR value of 4 percent. However, these were only encountered in 2 borings and within those borings were generally encountered at depths below 3 feet. The middle Group Indices of 4 to 7 associated with the A-4a cohesive soils would correlate with CBR values of 6 to 8 percent. However, the A-4a cohesive soils with Group Indices of 4 to 7 were only encountered in 2 borings that were prescribed undercutting and replacement with granular fill to a depth of 15 and 21 inches. As such, based on the average design value calculations from GB-1, it does not appear to be unconservative to use the GB-1 design CBR value of 12 percent along the northern segment.

for Geotechnical Explorations published by the Office of Geotechnical Engineering. Additional information on soil boring analysis, stabilization and treatment methods, and design procedures, can be found in Geotechnical Bulletin 1: Plan Subgrades (GB1) also published by the Office of Geotechnical Engineering.

General planning information about soil types and properties can be found in the Soil Survey books, which are published for every county in Ohio. Additional information on soils and proper construction practices can be found in the Construction Inspection Manual of Procedures published by the Office of Construction Administration. The ODOT soil classification method is presented in the Specifications for Geotechnical Exploration.

ODOT's pavement design procedure uses a statistical reliability factor (see Section 204) to account for variability in subgrade stiffness. Because of this, the average CBR is to be used for pavement design. Often designers want to use the lowest CBR value to add an additional safety factor but this results in unnecessarily thick, wasteful designs.

203.1 Subgrade Resilient Modulus

The subgrade resilient modulus is a measure of the ability of a soil to resist elastic deformation under repeated loading. Many soils are stress dependent. As the stress level increases, these soils will behave in a non-linear fashion. Fine-grained soils tend to be stress-softening, whereas granular soils tend to be stress-hardening. The laboratory resilient modulus test, AASHTO T 307 or NCHRP 1-28A, is designed to determine the strain due to a repeated load (deviator stress) which simulates the effect of loads passing over a section of pavement.

Based on limited research and several current publications, ODOT has adopted a standard relationship between modulus of resilience (M_r) and the California bearing ratio (CBR) shown below. The units for resilient modulus are pounds per square inch (psi).

$M_r = 1200 * CBR$

South Segment

GB-1 Calculated CBR = 5 percent
$M_r = 1200 * CBR = 1200 * 5 = 6{,}000$ psi

North Segment

GB-1 Calculated CBR = 12 percent
$M_r = 1200 * CBR = 1200 * 12 = 14{,}400$ psi

203.2 California Bearing Ratio

The California bearing ratio (CBR) is a value representing a soil's resistance to shearing under a standard load, compared to the resistance of crushed stone subjected to the same load. The CBR is obtained by performing a laboratory penetration test of a soaked sample of soil. The load required to produce a penetration at each 0.1 inch depth in the soaked sample is divided by a standard, which has been developed for crushed stone, then multiplied by 100.

203.3 Group Index

In order to reduce the amount of laboratory testing required to characterize the soil stiffness, ODOT developed a relationship between CBR and group index. This relationship was developed in the 1950's by testing hundreds of soil samples. Group Index is a function of a soil's Atterberg Limits and gradation. The equation for group index is given in Appendix A of the Specifications for Geotechnical Exploration published by the Office of Geotechnical Engineering. Figure 203-1 contains a nomograph that solves the group index equation. Group index is then correlated to CBR using the chart in Figure 203-2.

203.4 Subgrade Stabilization

Undercutting or chemical stabilization of the subgrade should be determined in accordance with GB1. Questions regarding subgrade stabilization should be directed to the Office of Geotechnical Engineering.

203.4.1 Global Chemical Stabilization

When the entire subgrade is chemically stabilized without exception (global chemical stabilization), the subgrade resilient modulus of the native soil is increased. Research has shown that global chemical stabilization increases the stiffness of the subgrade and the effects are long lasting. The increased resilient modulus is calculated using the following formula:

$M_{r\text{-}GCS} = 1.36 * M_r$ Method

Where:

$M_{r\text{-}GCS}$ = Improved subgrade resilient modulus due to global chemical stabilization (psi)
M_r = Subgrade resilient modulus of the native soil (psi)

M_r = 6,000 psi @ CBR = 5 percent
$M_{r\text{-}GCS} = 1.36 * M_r = 1.36 * 6{,}000 = 8{,}160$ psi
$CBR\text{-}GCS = M_{r\text{-}GCS} / 1200 = 8{,}160 / 1{,}200 = 6.8$ %
Design CBR-GCS = 7 percent

South Segment Design CBR-GCS = 7 percent

North Segment Design CBR-GCS = 16 percent

204 Reliability

AASHTO defines reliability as the probability that the load applications a pavement can withstand in reaching a specified minimum serviceability level is not exceeded by the number of load applications that are actually applied to the pavement. Reliability is a statistical tool used in pavement design that assumes a standard normal distribution exists for all pavement design parameters and allows the designer to account for deviation from the average equally for all parameters. Reliability can be thought of as a safety factor. Figure 201-1 lists the reliability factors to be used in pavement design for various classifications of highways.

204.1 Overall Standard Deviation

The overall standard deviation (variance) is a measure of the spread of the probability distribution for ESALs vs. Serviceability, considering all the parameters used to design a pavement. Figure 201-1 lists the overall standard deviation to be used in pavement design.

205 Subsurface Pavement Drainage

Subsurface pavement drainage is required on all projects greater than 0.5 miles (0.8 km) long that consist of constructing new pavement on subgrade or rubblizing the existing pavement. Subsurface drainage may be installed on any type of project and any length, if needed.

Lack of adequate pavement drainage is a primary cause of distress in many pavements. Excess moisture in the base and subgrade reduces the amount of stress the subgrade can tolerate without permanent strain. Strain in the subgrade transfers stress into the upper pavement layers resulting in deformation and ultimately distress. Trapped moisture in flexible pavement systems leads to stripping, raveling, debonding, and rutting. Excess moisture in rigid pavement systems leads to pumping, faulting, cracking, and joint failure.

205.1 Types of Drainage Systems

There are three means of draining the pavement subsurface - pipe underdrains, prefabricated edge underdrains, and aggregate drains. Pipe underdrains are the primary method to provide drainage and are generally used with paved shoulders and curbed sections. Occasionally, when an existing pavement is being overlaid, prefabricated edge underdrains are installed to provide drainage. Aggregate drains are generally used with aggregate shoulders, bituminous surface treated shoulders, and for spot improvements. In the past, another type of subsurface drainage, free draining base (FDB), was used but is no longer approved for use on ODOT projects and the specifications have been rescinded.

Figures 205-1 to 205-10 provide details on the placement of subsurface drainage systems. Additional examples are found in the Sample Plan Sheets.

Appendix B:
Geotechnical Engineering Design Checklists

Ohio Department of Transportation
Geotechnical Engineering
Design Checklists

Version 5.0
January 17, 2020

Preface

Geotechnical design features that arise in the development of roadway projects vary both in type and complexity. Cuts, embankments, wetlands, mine issues, and rock slopes are just some geotechnical issues encountered on transportation projects. Consistent and comprehensive reconnaissance, analysis, and plan preparation are necessary to ensure that all possible geotechnical issues that may occur on a project will be adequately identified and accounted for on the final plans.

A set of topical review checklists, a reference list, and a technical publications list have been developed to aid the project development personnel in their production of geotechnically sound project plans. All projects that contain geotechnical related issues will benefit from the use of this document. Although it is expected that the District Geotechnical Engineer will be one of the main users of these checklists, any personnel responsible for a geotechnical aspect of the project plan development will use this document. Possible users of this checklist include, but are not limited to, design and geotechnical Consultants and District and Central Office Planning and Production staff.

The design checklists are provided to assist the project development personnel in:

- Developing a comprehensive geotechnical scope of services
- Developing and reviewing geotechnical reports and assimilating information
- Analyzing, designing, and reviewing geotechnical related aspects of a transportation project, including needs assessment, plans, and specifications
- Recognizing cost-saving opportunities
- Identifying deficiencies due to inadequate geotechnical investigation, analysis, or design
- Recognizing when to request additional technical assistance from a geotechnical specialist
- Defining areas of needed training

At first glance, the design checklist will seem to be inordinately lengthy. One, however, should not avoid using the checklist because of this. Only on major and complex projects will it be necessary to complete most of the checklist. Just those checklists that pertain to a specific geotechnical feature encountered on the project should be completed. Therefore, for most projects, only a small portion of the checklist will need to be completed.

Since several entities may be involved in the geotechnical development of a transportation project, it is possible that there may be more than one set of checklists completed for a specific project, or different entities may fill out different sections of the checklist. It is anticipated that all completed checklists will be included with the project file in District or Central Office.

<u>To utilize the checklists,</u>

- First fill out the project information on the Checklist Cover tab. The project information in the headings of the rest of the checklists will autopopulate. Also indicate which checklists will be utilized.
- Complete only the checklists that apply to the project by using the dropdown boxes.
- Submit the checklist cover along with all completed checklists with the report and plan submission

Additional topics and questions may be added as the development of these checklists continues and input is received from the users. All additional updates, bulletins, and design guidance will be issued from the Office of Geotechnical Engineering and available on the internet at the Design Reference Resource Center. The Administrator of the Office of Geotechnical Engineering will be the point of contact regarding the checklist, and any questions, recommendations, and training requests should be directed to the Office Administrator.

Table of Contents

Symbols and Abbreviations

Y	Yes
N	No
X	Not Applicable (Reason should be explained in the “Notes” area of the checklist)
✓	Selected item utilized
AASHTO	American Association of State Highway and Transportation Officials
AML	Abandoned Mine Land Reclamation Program, DMRM, ODNR
AUMIRA	Manual for Abandoned Underground Mine Inventory and Risk Assessment, ODOT
BDM	Bridge Design Manual, ODOT
CBR	California Bearing Ratio
C&MS	Construction and Material Specifications, ODOT
DGE	District Geotechnical Engineer, ODOT District
DGS	Division of Geological Survey, ODNR
DMRM	Division of Mineral Resources Management, ODNR
DSWC	Division of Soil and Water Conservation, ODA
EPA	Ohio Environmental Protection Agency
FHWA	Federal Highway Administration
F.S.	Factor of Safety
GB	Geotechnical Bulletin, OGE (Always followed by the applicable number (e.g., GB4))
L&D1	Location & Design Manual, Volume 1, ODOT
L&D3	Location & Design Manual, Volume 3, ODOT
LRFD	Load and Resistance Factor Design
N_{60}	Standard Penetration Value, normalized to 60 percent of drill rod energy ratio
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OGE	Office of Geotechnical Engineering, ODOT
OSMRE	Office of Surface Mining Reclaimation and Enforcement, U.S. Department of the Interior
ROW	Right of Way
RQD	Rock Quality Designation
SDI	Slake Durability Index
SGE	Specifications for Geotechnical Explorations, ODOT
SPT	Standard Penetration Test
TIMS	Transportation Information Mapping System, ODOT
UBV	Ultimate Bearing Value
USGS	U.S. Geological Survey
WEAP	Wave Equation Analysis of Pile Driving (Software)

I. Geotechnical Design Checklists

Project: HEN-109-06.00	PDP Path:
PID: 95741	Review Stage: 1

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. Soil Profile VI. D. Geotechnical Reports	✓

II. Reconnaissance and Planning Checklist

C-R-S:	HEN-109-06.00	PID:	95741	Reviewer:	LGH	Date:	2/14/2023

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

Planning - General		(Y/N/X)	Notes:
5	In planning the geotechnical exploration program for the project, have the specific geologic conditions, the proposed work, and historic subsurface exploration work been considered?	Y	
6	Has the ODOT Transportation Information Mapping System (TIMS) been accessed to find all available historic boring information and inventoried geohazards?	Y	
7	Have the borings been located to develop the maximum subsurface information while using a minimum number of borings, utilizing historic geotechnical explorations to the fullest extent possible?	Y	
8	Have the topography, geologic origin of materials, surface manifestation of soil conditions, and any other special design considerations been utilized in determining the spacing and depth of borings?	Y	
9	Have the borings been located so as to provide adequate overhead clearance for the equipment, clearance of underground utilities, minimize damage to private property, and minimize disruption of traffic, without compromising the quality of the exploration?	Y	

II. Reconnaissance and Planning Checklist

Planning - General		(Y/N/X)	Notes:
10	Have the scaled boring plans, showing all project and historic borings, and a schedule of borings in tabular format, been submitted to the District Geotechnical Engineer?	N	Boring location plan is included in this report submittal.
	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, probes, 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	

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)		
	Rockfall (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,b,c)		
	Noise Barrier (Type E4)		
	CCTV & High Mast Lighting Towers (Type E5)		
	Buildings and Salt Domes (Type E6)		

III.C. Subgrade Checklist

C-R-S: HEN-109-06.00	PID: 95741	Reviewer: LGH	Date: 2/14/2023

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 Geotechnical Bulletin 1: Plan Subgrades (GB1)?	Y	
a. Has each sample been visually classified and inspected for the presence of gypsum? Has a moisture content been performed on each sample?	Y	
b. Has mechanical classification (Plastic Limit (PL), Liquid Limit (LL), and gradation testing) been done on at least two samples from each boring within six feet of the proposed subgrade?	Y	
c. Has the sulfate content of at least one sample from each boring within 3 feet of the proposed subgrade been determined, per Supplement 1122, Determining Sulfate Content in Soils?	Y	
d. Has the sulfate content of all samples that exhibit gypsum crystals been determined?	X	No gypsum observed in samples.
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?	X	None present.
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 (soil profile), do the plans specify that these materials need to be removed and replaced or chemically stabilized?	X	None present.
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	
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?	X	None present.
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	

III.C. Subgrade Checklist

Subgrade	(Y/N/X)	Notes:
4 In accordance with GB1, do the SPT (N_{60})/HP values and existing moisture contents for the proposed subgrade soils indicate the need for subgrade stabilization?	N	
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)?	N	Plans to be prepared by others.
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?	N	Plans to be prepared by others. Lime - South Segment Cement - North Segment
Indicate type of chemical 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 to be prepared 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	Plans to be prepared by others.
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 to be prepared by others.
8 Has a design CBR value been provided?	Y	

VI.B. Geotechnical Reports

C-R-S: HEN-109-06.00	PID: 95741	Reviewer: CER	Date: 12/11/2024

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 may be used for this.	Y	The gINT Project file is being provided with this submittal.
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 705.1 of the SGE?	Y	
Report Body		**(Y/N/X)**	**Notes:**
7	Do all geotechnical reports being submitted contain the following:		
a.	an Executive Summary as described in Section 705.2 of the SGE?	Y	
b.	an Introduction as described in Section 705.3 of the SGE?	Y	
c.	a section titled "Geology and Observations of the Project," as described in Section 705.4 of the SGE?	Y	
d.	a section titled "Exploration," as described in Section 705.5 of the SGE?	Y	
e.	a section titled "Findings," as described in Section 705.6 of the SGE?	Y	
f.	a section titled "Analyses and Recommendations," as described in Section 705.7 of the SGE?	Y	
Appendices		**(Y/N/X)**	**Notes:**
8	Do all geotechnical reports being submitted contain all applicable Appendices as described in Section 705.8 of the SGE?	Y	
9	Do the Appendices present a site Boring Plan showing all boring locations as described in Section 705.8.1 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 705.8.2 of the SGE?	Y	
11	Do the Appendices include reports of undisturbed test data as described in Section 705.8.3 of the SGE?	Y	
12	Do the Appendices include calculations in a logical format to support recommendations as described in Section 705.8.4 of the SGE?	Y	

Appendix C:
Historic Borings

1994	Year	016607

02926 (0)	County	HENRY
Job No.	Bridge No.	HEN-109-10.589 (to be 66.11)
Changes	Section	
		☑ Over ☐ Under
	Location	WEST CREEK

STORAGE DATA	
FOLDER	
Section File No.	
Record Center No.	4-N-13
TRACINGS	
Section File No.	
Record Center No.	~~4-N-11~~

Topo Sheet	542-S-SE

Project Code	4358

Site Plans	
Date Rec'd.	
Revisions	
No. Copies	

Design By _____

	RECON	AUGER	CORE	DRIVE ROD
By			M.S.	
Dates			12/6-13/94	
No. of Holes or Soundings			~~3~~ 2	
Footage			92.0'	
Samples Tested			32	

☐ Samples Accounted

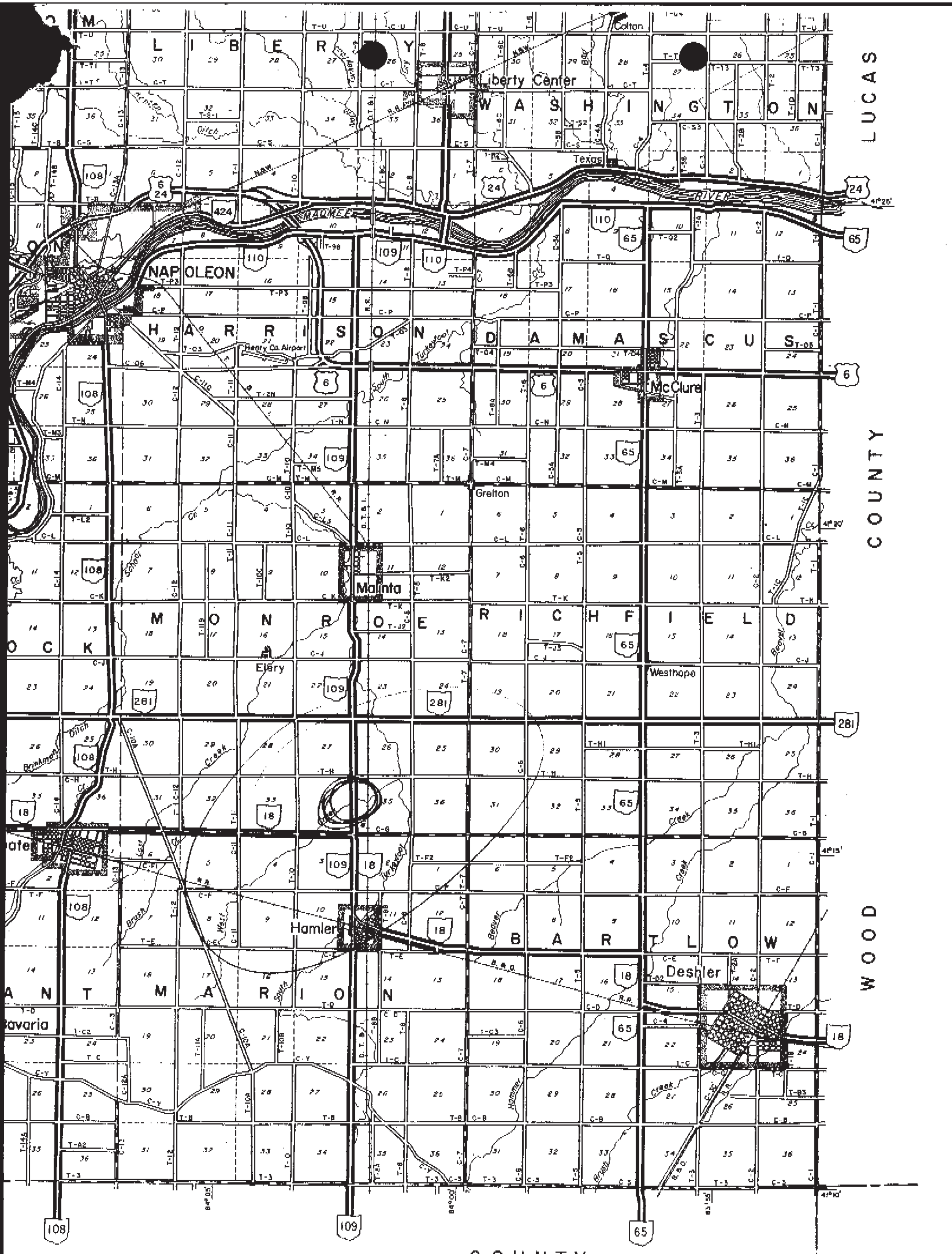
No. of Tracings	

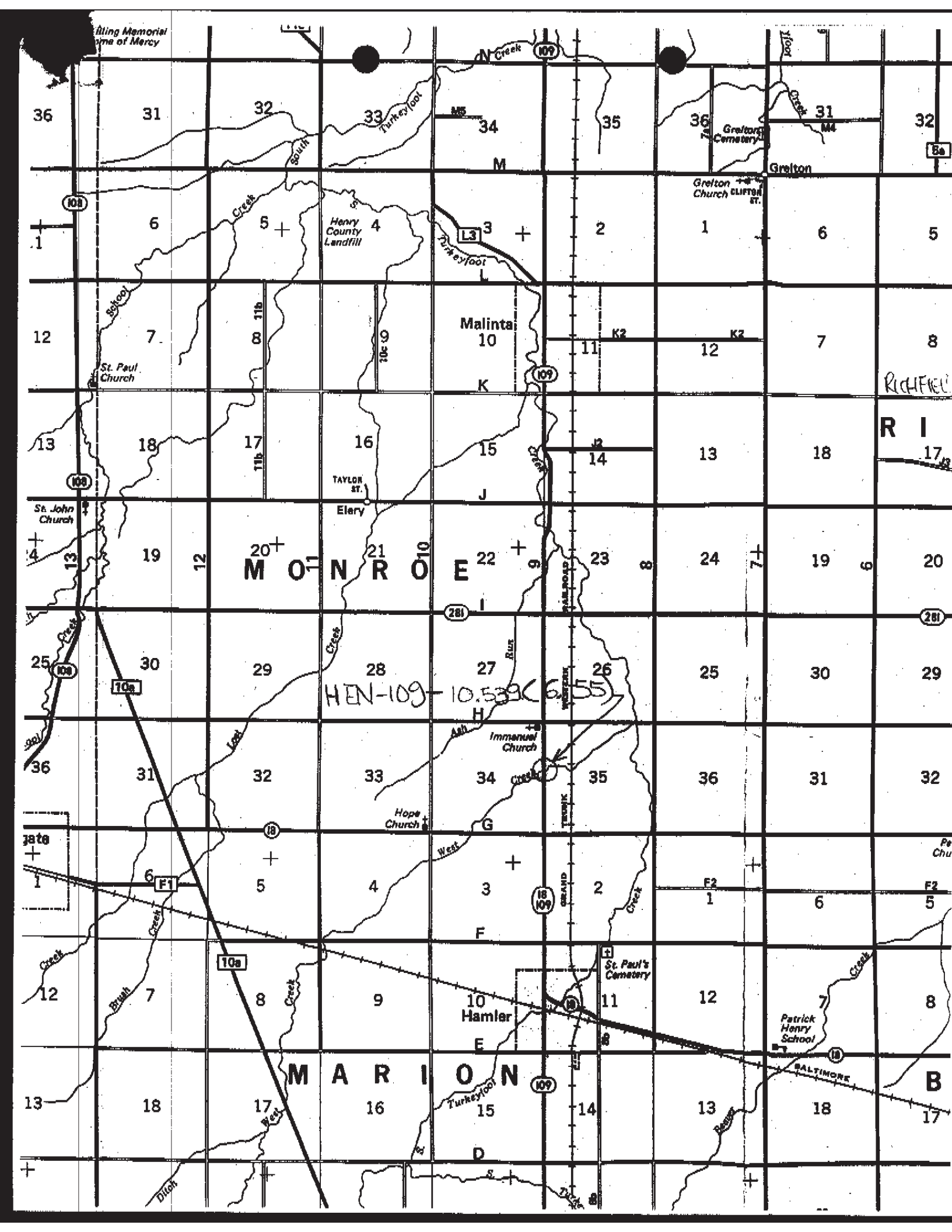
Remarks 4 sheets 8½" x 11"

Transmittal Date 1/23/95 Revisions _____ Refer to _____

AUGER DATA			DRIVE ROD DATA		CORE DATA		
No. of Holes	Footage	Samples	No. of Soundings	Footage	No. of Holes	Footage	Samples
					2	92.0'	32

Form TE-156 Revised 1/89


LIBERTY
Liberty Center
WASHINGTON
Colton
Texas
MAUMEE RIVER
NAPOLEON
HARRISON
DAMASCUS
Henry Co. Airport
McClure
Grelton
Malinta
MONROE
RICHFIELD
Elery
Westhope
Hamler
BARTLOW
Deshler
MARION
Bavaria
LUCAS COUNTY
WOOD COUNTY
COUNTY


Grelton
Grelton Church
Grelton Cemetery
Malinta
Elery
Hamler
MONROE
MARION
Henry County Landfill
St. Paul Church
St. John Church
Immanuel Church
Hope Church
St. Paul's Cemetery
Patrick Henry School
Turkeyfoot Creek
South Creek
West Creek
Ash Creek
Brush Creek
Ditch
Run
TAYLOR ST.
CLIFTON ST.
BALTIMORE
HEN-109-10.53C6.55

FIELD DATA - SOIL LOG

Project Code: 4 3 5 8

Project Identification: Hen-109-6.55
Co., Rt., Br.No./Sec.No.

Station: ~~9 9 + 6 3~~ | Offset: 6 L | Order Code: 0 1

Location No. ~~X~~ 1 ?South Pier-Abut. | Over: West Creek

99+988.7 ~~km~~ - 1.83 Lt

Started: 12-6-94 | Equipment: B-53

Completed: 12-12-94 | Water Level:

2/3.30 m
~~699.8~~ APPROX TOPO
Elevation

Depth Feet	Samples	Elevation	Description	
0			.7 Asphalt	
			Br. Sandy Clay	
	①		2.5 - 4.0	B-5-7-7
			Br. + Gr. Sandy Clay	
5	②		5.0 - 6.5	B-4-6-6
			Br. Till	
10	③	Flow Line	10.0 - 11.5	B-10-17-26
			Gr. Till	
	④		11.5 - 13.0	B-19-29-47
			Br. Till	
	⑤		13.0 - 14.5	B-12-15-23
15			Gr. Till	
	⑥		14.5 - 16.0	B-10-14-21
			Br + Gr. Till	
	⑦		16.0 - 17.5	B-6-11-17
			Gr. Till	
20	⑧		17.5 - 19.0	B-5-12-18
			Gr. Till	
	⑨		20.0 - 21.5	B-6-11-21
			Gr. Till	
	⑩		22.5 - 24.0	B 6-13-21
25				

Depth Feet	Samples		Description	
25			Gr. Till	
	⑪		25.0 - 26.5	B-3-12-16
			Gr. Till	
	⑫	Tube Wet	27.5 - 29.0	B-8-11-17
			Gr. Till	
30	⑬		30.0 - 31.5	B-8-10-19
			Gr. Till	
35	⑭		35.0 - 36.5	B-11-14-19
			Gr. Till	
40	⑮		40.0 - 41.5	B-16-25-38
			End of Boring 41.5	
45				
50				
55				
60				

Remarks:

Party: Hutt, Willis, Carey

Chief of Party: Snyder

Form TE-4
DOT-Revised 1/92

FIELD DATA - SOIL LOG

Project Code: 4 3 5 8

Project Identification: Hsn-109-6.55 (Co., Rt., Br.No./Sec.No.)

Station: + 0 0 + 2 5 . | Offset: 8 R

Order Code: 0 1

Location No. # 2 Over: West Creek

? NORTH Pier-Abut. 100 to 107.6, 2.4 m RT.

Started: 12-12-94 Equipment: B-53

Completed: 12-13-94 Water Level: -

213.24 m APPROX TOPO JBH
699.6 Elevation

Depth Feet	Samples		Description	
0			.3 Asphalt	
			Br. Silty Clay	
	(16)		2.5 - 4.0	B- 7-7-9
			Br & Gr. Sandy Clay	
5	(17)		5.0 - 6.5	B- 4-6-10
			Br. Till	
10	(18)	Flow Line	10.0 - 11.5	B- 11-18-21
			Br & Gr Sandy Clay with Stone Fragments	
	(19)		11.5 - 13.0	B- 15-16-21
			Gr. Till	
	(20)		13.0 - 14.5	B- 10-13-19
15			Gr. Till	
	(21)		14.5 - 16.0	B- 7-11-16
			Gr. Till	
	(22)		16.0 - 17.5	B- 4-10-15
			Gr. Till	
20	(23)		17.5 - 19.0	B- 7-11-16
			Gr. Till	
	(24)		20.0 - 21.5	B- 8-10-18
			Gr. Till	
	(25)		22.5 - 24.0	B- 7-12-15
25				
			Gr. Till	
	(26)		25.0 - 26.5	B- 6-9-17
			Soft Gr. Till	
	(27)		27.5 - 29.0	B- 9-11-13
			Soft Gr Sandy Silty Clay	
30	(28)		30.0 - 31.5	B 4-5-8
			Gr. Till	
35	(29)		35.0 - 36.5	B- 6-10-18
			Gr. Till	
40	(30)		40.0 - 41.5	B- 12-19-29
			Hard Gr. Till	
45	(31)		45.0 - 46.5	B - 28-47-63
			Sandy, Silty Clay with Small Stone Fragments	
50	(32)		50.0 - 50.6	B - 80
			End of Boring 50.6	
55				
60				

Remarks:

Party: Hutt, Willis, Carey

Chief of Party: Snyder

Form TE-6
DOT-Revised 1/92

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

METRIC PROJECT

LOG OF BORING

Date Started 12/6/94 Sampler: Type SS Dia. 34.93mm Water Elev. - Project Identification: HENRY
Date completed 12/12/94 DATUM APPROX. HEN-109-10.539km (0655 mi)
Boring No. B-1 Station & Offset 99+988.7, 1.8m LT.(SOUTH ABUT.) Surface Elev. 213.30m OVER WEST CREEK
STRUCTURE FOUNDATION INVESTIGATION

	Depth	Std. (N) Pen.	Rec.	Loss	Description	Sample No.	Physica Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	S-T. Class
213.30	0														
213.09		AUGERED			ASPHALT										VISUAL
212.64	1.0														
		5/7/7			BROWN SANDY CLAY	1	0	4	22	40	34	43	19	36	A-7-6
211.78	2.0	4/6/6			GRAY AND BROWN SANDY CLAY	2	0	2	21	32	45	41	22	18	A-7-6
210.25	3.0														
209.79		10/17/26			BROWN SILT AND CLAY,LOAMY	3	0	5	14	30	51	34	15	13	A-6A
209.34	4.0	19/23/47			GRAY WITH BROWN SILT AND CLAY	4	0	6	13	32	49	31	14	14	A-6A
208.88		12/15/23			BROWN SILTY CLAY	5	0	6	13	32	49	34	16	13	A-6B
208.42	5.0	10/14/21			GRAY SILT AND CLAY	6	0	5	13	30	52	31	14	15	A-6A
207.97		6/11/17			GRAY SILT AND CLAY	7	0	6	13	29	52	32	13	16	A-6A
207.20	6.0	5/12/18			GRAY SILT AND CLAY	8	0	5	12	32	51	33	15	15	A-6A
		6/11/21			GRAY SILTY CLAY	9	0	4	10	28	58	34	16	16	A-6B
206.44	7.0														
		6/13/21			GRAY SILT AND CLAY	10	0	3	8	37	52	31	13	16	A-6A
205.68	8.0	3/12/16			GRAY SILT AND CLAY	11	0	2	5	43	50	29	11	15	A-6A
204.92															
	9.0	8/11/17			GRAY SILT AND CLAY	12	0	4	9	32	55	31	13	17	A-6A
204.16															
		8/10/19			GRAY SILT AND CLAY	13	0	5	10	35	50	31	13	17	A-6A
	10.0														
202.63															
	11.0	11/14/19			GRAY SILT AND CLAY	14	0	5	9	35	51	30	12	16	A-6A

Particle Sizes: Aggs >2.00mm; Coarse Sand: 2.00-0.42mm, Fine Sand: 0.42-0.074mm, Silt: 0.074-0.005mm, Clay: <0.005mm

Boring No. B-1 Station & Offset 99+988.7, 1.8m LT.(SOUTH ABUT.) APPROX. Surface Elev. 213.30m Project: HEN-109-10.539km (0655mi)

Elev.	Depth	Std. Pen. (N)	Rec. m	Loss m	Description	Sample No.	Physical Characteristics % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class
201.10	12.0														
200.65		16/25/38			GRAY SILTY CLAY	15	0	4	9	32	55	33	17	16	A-6B
	13.0				BOTTOM OF BORING										
	14.0														
	15.0														
	16.0														
	17.0														
	18.0														
	19.0														
	20.0														
	21.0														
	22.0														
	23.0														
	24.0														

State of Ohio
Department of Transportation
Division of Highways
Testing Laboratory

METRIC PROJECT

LOG OF BORING

Date Started 12/12/94 Sampler: Type SS Dia. 34.93mm Water Elev. -
Date completed 12/13/94 DATUM
Boring No. B-2 Station & Offset 100+007.6, 2.4m RT.(NORTH ABUT.) APPROX. Surface Elev. 213.24m

Project Identification: HENRY
HEN-109-10.539km (0655mi)
OVER WEST CREEK
STRUCTURE FOUNDATION INVESTIGATION

Elev.	Depth	Std. Pen. (N)	Rec. m	Loss m	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class
213.24	0					-	-	-	-	-	-	-	-	-	
213.00															
212.48	1.0														
		7/7/9			GRAYISH BROWN SANDY CLAY	16	0	6	15	36	43	33	15	15	A-6A
211.72															
	2.0	4/6/10			BROWN SANDY CLAY	17	0	4	16	33	47	44	22	20	A-7-6
210.19	3.0														
209.73		11/18/21			BROWN SANDY CLAY	18	0	6	14	35	45	32	14	15	A-6A
209.28	4.0	13/16/21			BROWN SILT AND CLAY	19	0	6	13	36	45	31	13	14	A-6A
208.82		10/13/19			BROWNISH GRAY SILT AND CLAY	20	0	6	13	35	46	30	14	14	A-6A
208.36	5.0	7/11/16			GRAY SILT AND CLAY	21	0	5	11	36	48	29	13	14	A-6A
207.91		4/10/15			GRAY SILT AND CLAY	22	0	6	12	34	48	32	15	15	A-6A
	6.0	7/11/16			GRAY SILT AND CLAY	23	0	6	13	33	48	31	14	16	A-6A
207.14															
		8/10/18			GRAY SILT AND CLAY	24	0	5	12	34	49	30	13	15	A-6A
206.38	7.0														
		7/12/15			GRAY SILTY CLAY	25	0	5	10	34	51	32	16	17	A-6B
205.62															
	8.0	6/9/17			GRAY SILT AND CLAY	26	0	3	7	45	45	28	11	16	A-6A
204.86															
204.10	9.0	9/11/13			GRAYISH BROWN CLAYEY SILT	27	0	1	3	62	34	25	8	17	A-4B
		4/5/8			GRAY SILT AND CLAY	28	0	0	1	48	51	28	11	21	A-6A
	10.0														
202.57															
	11.0	6/10/18			GRAY SILT AND CLAY	29	0	4	9	38	49	30	13	16	A-6A

Boring No. B-2 Station & Offset 100+007.6, 2.4m RT.(NORTH ABUT.) APPROX. Surface Elev. 213.24m Project: HEN-109-10.539km (0655mi)

Elev.	Depth	Std. (N) Pen.	Rec. m	Loss m	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHT. Class
	12.0														
201.05		12/19/29			GRAY SILT AND CLAY	30	0	4	9	51	36	33	15	15	A-6A
	3.0														
199.24	14.0	28/47/63			GRAY SANDY SILT	31	0	10	20	32	38	24	10	10	A-4A
	15.0														
198.00		80(.18m)			GRAY SANDY SILT	32	0	5	17	63	15	NP	NP	13	A-4B
197.82	16.0				BOTTOM OF BORING										
	17.0														
	18.0														
	19.0														
	20.0														
	21.0														
	22.0														
	23.0														
	24.0														

SUMMARY OF SOIL TEST DATA 01/12/95

PROJECT CODE - 4358
NOTE - NP SHOWN IN LIQUID LIMIT AND PLASTICITY
COLUMNS INDICATES A NON-PLASTIC MATERIAL

LAB NO	STATION & OFFSET	DEPTH FROM	TO	AGG	PERCENTAGES CS	FS	SILT	CLAY	LL	PI	WC	OHIO CLASS	COMP CLASS	MST
81237	99+63,006 L	02.5-	04.0	0	4	22	40	34	43	19	36	A-7-6	A-7-6	
81238		05.0-	06.5	0	2	21	32	45	41	22	18	A-7-6	A-7-6	
81239		10.0-	11.5	0	5	14	30	51	34	15	13	A-6A	A-6A	
81240		11.5-	13.0	0	6	13	32	49	31	14	14	A-6A	A-6A	
81241		13.0-	14.5	0	6	13	32	49	34	16	13	A-6B	A-6B	
81242		14.5-	16.0	0	5	13	30	52	31	14	15	A-6A	A-6A	
81243		16.0-	17.5	0	6	13	29	52	32	13	16	A-6A	A-6A	
81244		17.5-	19.0	0	5	12	32	51	33	15	15	A-6A	A-6A	
81245		20.0-	21.5	0	4	10	28	58	34	16	16	A-6B	A-6B	
81246		22.5-	24.0	0	3	8	37	52	31	13	16	A-6A	A-6A	
81247		25.0-	26.5	0	2	5	43	50	29	11	15	A-6A	A-6A	
81248		27.5-	29.0	0	4	9	32	55	31	13	17	A-6A	A-6A	
81249		30.0-	31.5	0	5	10	35	50	31	13	17	A-6A	A-6A	
81250		35.0-	36.5	0	5	9	35	51	30	12	16	A-6A	A-6A	
81251		40.0-	41.5	0	4	9	32	55	33	17	16	A-6B	A-6B	
81252	100+25,008 R	02.5-	04.0	0	6	15	36	43	33	15	15	A-6A	A-6A	
81253		05.0-	06.5	0	4	16	33	47	44	22	20	A-7-6	A-7-6	
81254		10.0-	11.5	0	6	14	35	45	32	14	15	A-6A	A-6A	
81255		11.5-	13.0	0	6	13	36	45	31	13	14	A-6A	A-6A	
81256		13.0-	14.5	0	6	13	35	46	30	14	14	A-6A	A-6A	
81257		14.5-	16.0	0	5	11	36	48	29	13	14	A-6A	A-6A	
81258		16.0-	17.5	0	6	12	34	48	32	15	15	A-6A	A-6A	
81259		17.5-	19.0	0	6	13	33	48	31	14	16	A-6A	A-6A	
81260		20.0-	21.5	0	5	12	34	49	30	13	15	A-6A	A-6A	
81261		22.5-	24.0	0	5	10	34	51	32	16	17	A-6B	A-6B	
81262		25.0-	26.5	0	3	7	45	45	28	11	16	A-6A	A-6A	
81263		27.5-	29.0	0	1	3	62	34	25	8	17	A-4B	A-4B	
81264		30.0-	31.5	0	0	1	48	51	28	11	21	A-6A	A-6A	
81265		35.0-	36.5	0	4	9	38	49	30	13	16	A-6A	A-6A	
81266		40.0-	41.5	0	4	9	51	36	33	15	15	A-6A	A-6A	
81267		45.0-	46.5	0	10	20	32	38	24	10	10	A-4A	A-4A	
81268		50.0-	50.6	0	5	17	63	15	NP	NP	13	A-4B	A-4B	

AVERAGE RESULTS OF TESTS
32 SAMPLES TESTED

01/12/95

H.R.B. CLASS	OHIO CLASS	AGG	COARSE SAND	FINE SAND	SILT	CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
A-4A (7)	A-4A	0	10	20	32	38	24	10	10	1
A-4B (8)	A-4B	0	3	10	63	24	25	4	15	2
A-6A (9)	A-6A	0	5	10	36	49	31	13	15	22
A-6B (10)	A-6B	0	5	10	32	53	33	16	16	4
A-7-6(13)	A-7-6	0	3	20	35	42	43	21	25	3
VISUAL										0

1940 Year

Job No. [ ]

Changes _____

FEP-16 4E-57

File No. 513-025

County HENRY - WOOD

012430 Project Identification HEN-Woo-281-(9.91) (0.00 - 2.09) HEN-Woo-SH 591-A,B,C,D

Proj. No. _____

Begin Sta. _____ End Sta. _____ Length 9.91 Miles

	RECON	AUGER	CORE	DRIVE ROD	RESISTIVITY
By		ENG. Pers			
Dates		3/8/40.			
No. of Holes or Soundings					
Footage		848-5			
Samples Tested		128			

Drafting By NLE, FWR, RMP

Completion Date

Drafting Hours

Topo Sheet

☐ Samples Accounted For

Transmittal Date 4/5/40

No. of Tracings 5 Filed with year 4-11-15 FET-18

Revisions _____

Remarks _____

Refer to _____

DO NOT WRITE IN THIS SPACE

Length	Auger Data			Core Data			Drive Rod Data		Resistivity
	No. of Holes	Footage	Samples	No. of Holes	Footage	Samples	No. of Soundings	Footage	No. of Locations

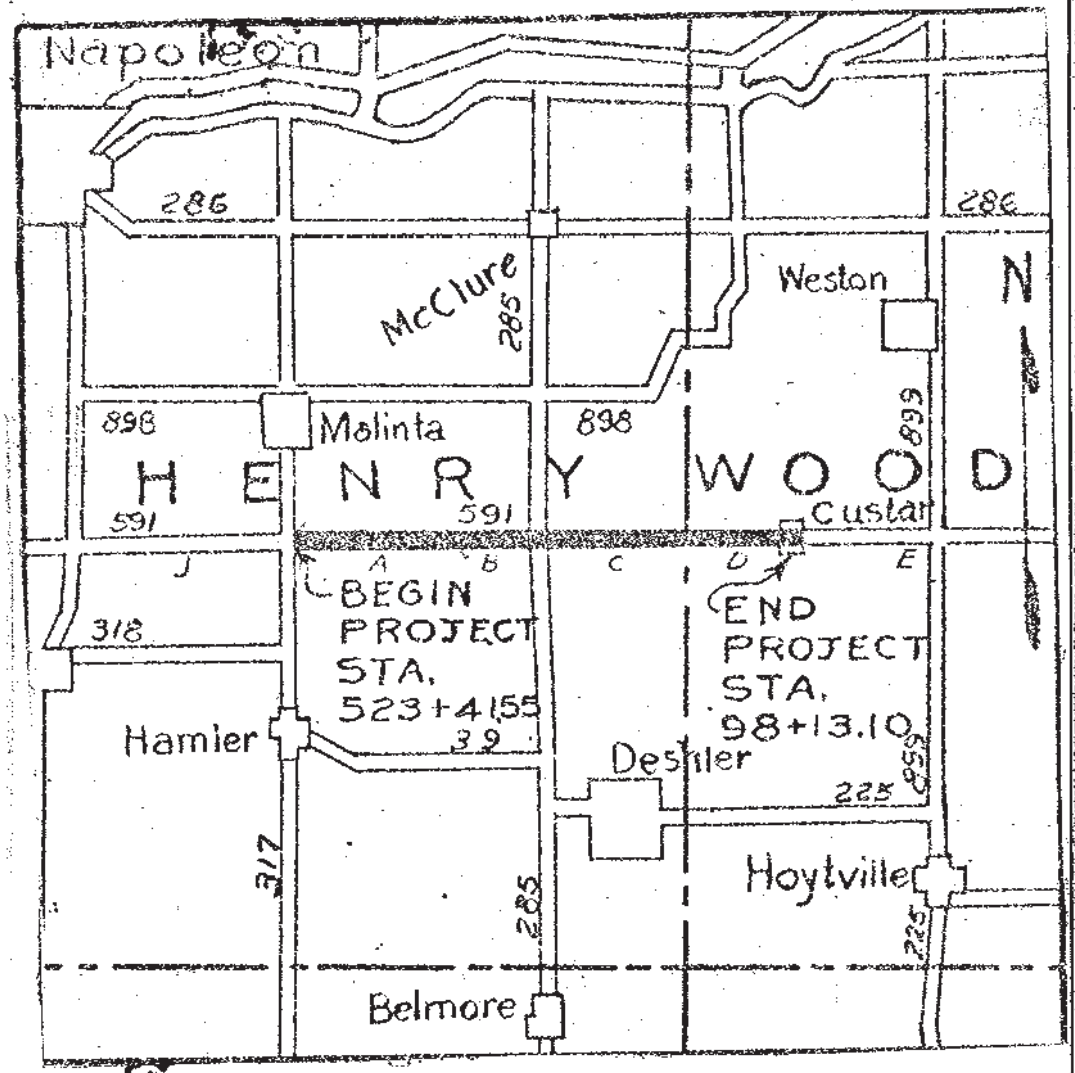
* See Reverse Side

TOTAL SAMPLES

Samples VOIDED	Auger	Drive	Samples USED	Auger	Drive

TOTAL MILEAGE

Alignment	Stations From——To	Mileage



012430

Henry - Wood - Co. SH-51 - Sec. A, R, 3rd D.

Sta. 542 + 00 - 17' Lt. - SE: 695.7

0 - .2 - Berm Matl.

1. .2 - 2' - Dark Frozen Silty Clay

2. 2' - 4' - Yellow Silty Clay

3. 4 - 5.5 - Br. Yellow " " "

H₂O @ 5.5'

Sta 542 + 00 - 16' Lt. - SE: 695.2

0 - .3 - Berm Matl.

.3 - 2.0 - Like #1

2.0 - 3.5 - " #2

3.5 - 6.2 - " #3 H₂O @ 5.5'

Sta. 532 + 00 - 17' Lt. - SE: 694.9

0 - .2 - Berm Matl.

.2 - 2' - Like #1

2' - 3.5' " #2

4. 3.5 - 5' - Br. Granular Clay

Stopped in Sand

Sta. 533 + 00 - 18' Lt. - SE: 694.5

0 - .2 - Berm Matl.

.2 - 2' - Like #1

2' - 4' - " #2

4' - 5' - " #3

Stopped in Sand

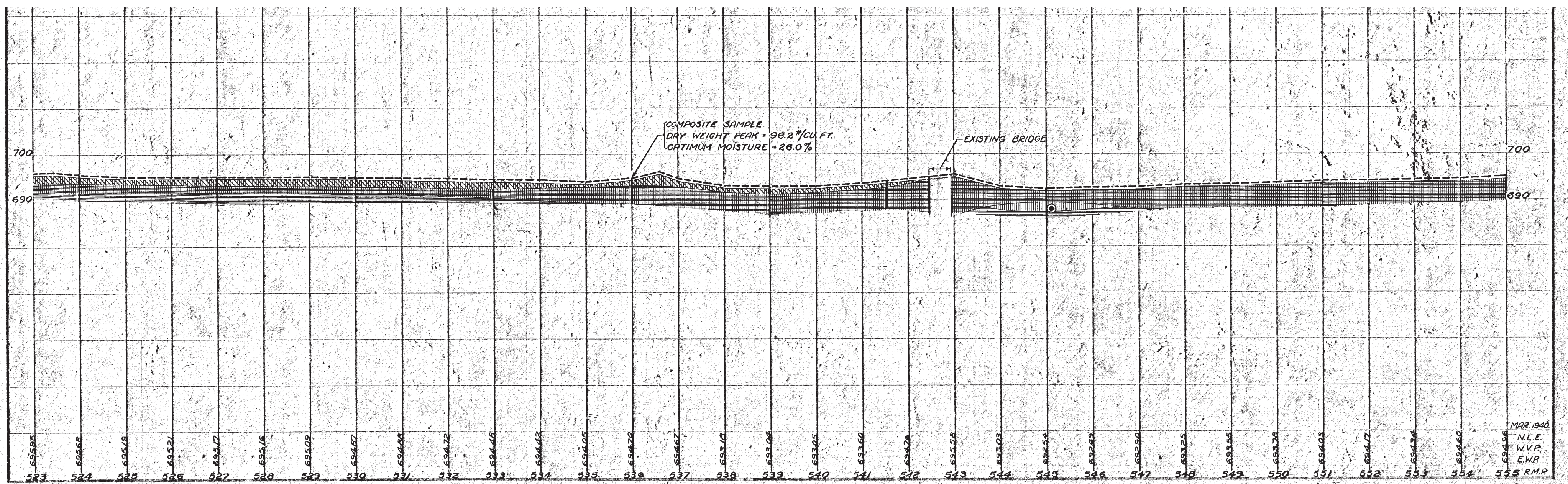
2/7

SUMMARY OF TESTS ON SUBGRADE SAMPLES

HENRY CO. - WOOD CO.

S.H. 591 SEC'S A, B, C, & D & CUSTAR (PT)

Lab. No. So.	Field Sample No.	Station No.	Represents (Feet)	Mechanical Analysis					Physical Characteristics			S.H.T.L. Class	B.P.R. Class
				Agg. %	C. Sand %	F. Sand %	Silt %	Clay %	Liquid Limit	Plasticity Index	Water Content		
24519	100	861+00, 19.0' Lt.	4.0'-5.5'	1.9	8.8	10.4	33.2	45.7	32.9	15.9	19.2	11	A-4
24520	101	864+00, 20.0' Lt.	5.0'-5.5'	2.1	12.1	10.6	33.0	44.2	37.2	10.8	25.0	11	"
24526	107	876+00, 23.0' Lt.	0.4'-2.0'	2.4	30.8	9.3	25.9	31.6	34.9	13.4	24.8	11	"
24528	109	882+00, 24.0' Lt.	3.0'-3.5'	0.2	22.8	26.8	27.2	23.0	30.1	13.1	21.7	11	"
24529	110	882+00, 24.0' Lt.	4.5'-5.5'	0.3	29.6	21.7	19.2	29.2	28.7	14.4	25.8	11	"
24534	115	891+00, 24.0' Lt.	4.0'-5.5'	2.1	26.3	21.8	20.0	29.8	32.0	16.4	19.5	11	"
24542	123	908+00, 24.0' Lt.	2.0'-3.0'	1.4	18.0	18.3	34.7	27.6	36.1	12.4	24.8	11	"
24543	124	908+00, 24.0' Lt.	3.0'-4.5'	3.8	15.2	29.4	26.0	25.6	33.6	17.2	18.8	11	"
24544	125	908+00, 24.0' Lt.	4.5'-5.0'	10.9	21.4	19.4	20.2	28.1	32.3	15.7	23.7	11	"
24547	128	923+00 24.0' Lt.	3.0'-5.5'	4.1	8.1	9.3	34.6	43.9	34.9	16.7	20.7	11	"
24548	129	925+00, 16.0' Lt.	0.4'-3.0'	2.3	14.0	14.0	37.9	31.8	33.1	11.6	21.8	11	"
24549	130	925+00, 16.0' Lt.	3.0'-5.5'	1.8	37.3	16.3	25.5	19.1	33.0	12.4	16.2	11	"
24550	131	935+00, 23.0' Lt.	3.0'-5.0'	3.3	8.7	9.7	33.3	45.0	31.8	11.9	15.6	11	"
24551	132	934+00, 22.0' Lt.	0.4'-2.5'	5.8	13.2	12.6	34.0	29.4	31.4	14.7	16.3	11	"
24566	147	940+00, 10.0' Rt.	4.5'-5.5'	2.9	9.8	14.0	31.2	42.1	32.6	13.8	26.8	11	"
24576	157	87+00, 18.0' Lt.	2.0'-5.5'	4.1	8.9	10.8	33.5	42.7	31.2	14.7	21.7	11	"
24578	159	97+50, 12.0' Lt.	0.7'-1.5'	7.0	15.9	25.8	27.9	23.4	34.6	14.9	21.5	11	"
24579	160	97+05, 12.0' Lt.	1.5'-4.0'	0.6	18.5	35.0	21.0	24.9	32.0	17.6	17.5	11	"
		Totals		118.8	468.3	491.3	862.0	959.6	935.0	404.8	578.8		
		Determinations		29	29	29	29	29	29	29	28		
		Averages		4.1	16.2	16.9	29.7	33.1	32.2	19.0	20.7	11	
24191	1	524+00, 17.0' Lt.	0.2'-2.0'	0.0	14.5	12.3	51.1	22.1	43.6	11.5	34.5	12	A-5
24208	18	587+00, 16.0' Lt.	0.2'-1.5'	0.7	13.5	12.3	39.7	33.8	40.8	13.2	28.6	"	"
24210	20	596+00, 18.0' Lt.	0.0'-0.8'	2.0	2.3	11.3	43.3	36.1	39.0	13.2	30.7	"	"
24268	29	623+00, 20.0' Lt.	0.0'-0.4'	4.9	17.0	8.1	27.7	42.3	40.3	16.9	25.5	"	"
24269	30	623+00, 20.0' Lt.	0.4'-1.5'	4.6	25.1	8.1	35.9	26.3	43.5	18.0	22.7	"	"
24271	32	628+00, 20.0' Lt.	1.2'-2.2'	2.1	15.8	11.4	32.0	38.7	45.7	17.6	24.8	"	"
24275	36	641+00, 18.0' Lt.	0.0'-0.6'	0.0	16.2	9.4	46.0	28.4	50.5	10.6	32.6	"	"
24279	40	645+00, 17.6' Lt.	0.6'-1.8'	3.3	17.4	11.7	33.8	33.8	44.5	19.0	33.2	"	"
24295	56	684+00, 18.0' Lt.	0.4'-2.0'	2.1	6.8	9.0	42.5	39.6	42.3	14.6	39.9	"	"
24300	61	711+00, 18.0' Lt.	0.0'-0.6'	0.7	9.9	10.4	48.1	30.7	41.1	12.3	27.6	"	"



COMPOSITE SAMPLE
DRY WEIGHT PEAK = 96.2 #/CU. FT.
OPTIMUM MOISTURE = 26.0%
EXISTING BRIDGE
700
690
700
690
695.95
695.68
695.19
695.21
695.17
695.16
695.09
694.87
694.88
694.72
694.48
694.42
693.05
694.70
694.67
693.18
693.04
693.05
693.60
694.76
695.58
693.03
692.54
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MAR. 1940
N.L.E.
W.V.P.
E.W.P.
R.M.P.

Year 1962 | Job No. 02462 | County HENRY

Changes

Project Identification HEN-109 (8.36)(1864)(2.08) D124

File No. FEP-111 4-L-52 | Proj. No.

Begin Sta. 439+00 / 983+00 / 1073+00 End Sta. 444+00 / 1009+00 / 1083+00 Length 0.74 Miles

	RECON	AUGER	CORE	DRIVE ROD	RESISTIVITY
By	PLH	CEG-TRS			
Dates	2/23/62	3/1-13/62			
No. of Holes or Soundings		15			
Footage		282.0			
Samples Tested		65			

Drafting By
RDS
Completion Date 3-28-62
Drafting Hours 52
Topo Sheet

☐ Samples Accounted For

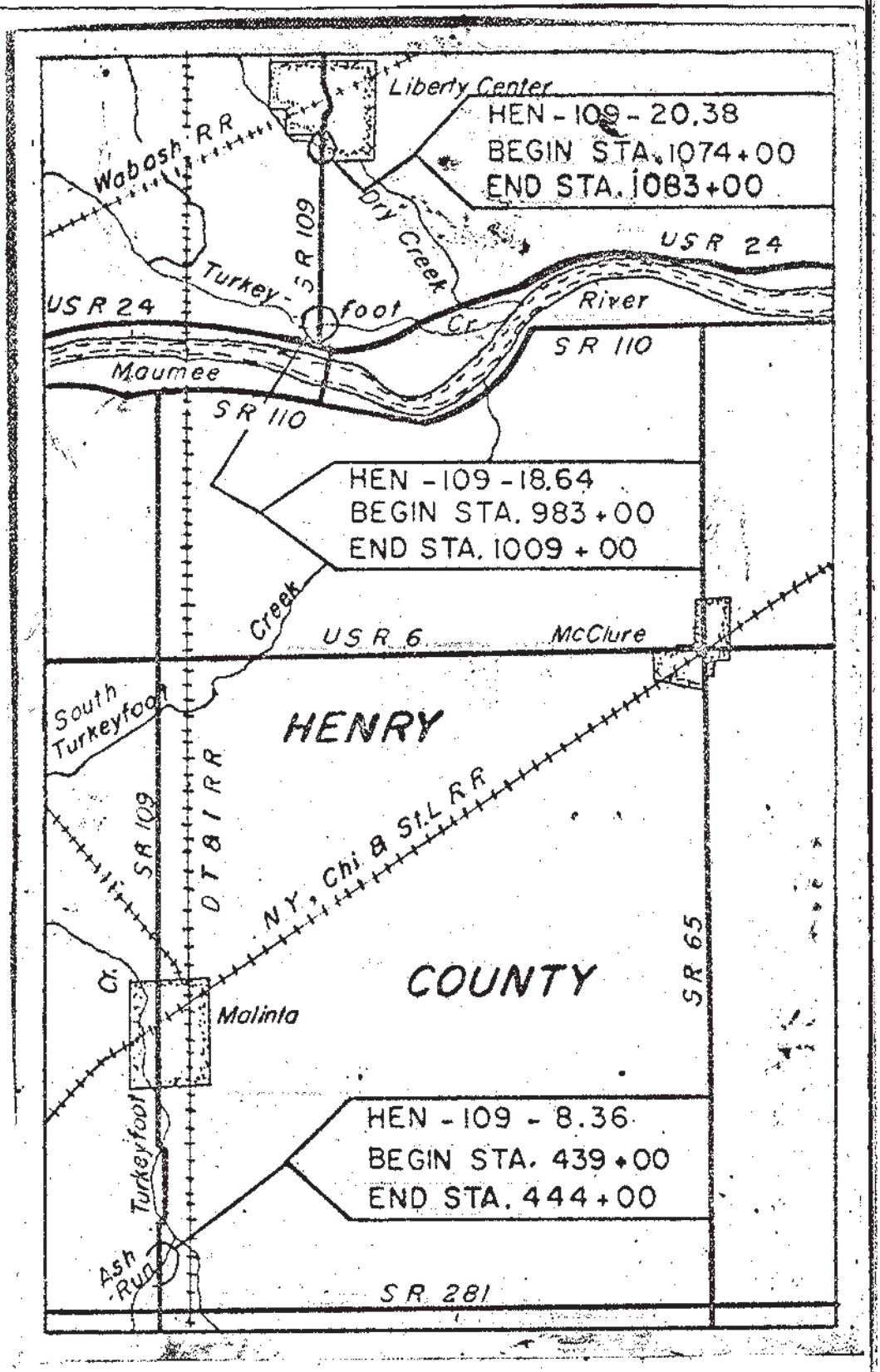
Transmittal Date 3-30-62 No. of Tracings 3 Filed with year 4-M-118

Revisions Remarks FET-118

Refer to

DO NOT WRITE IN THIS SPACE										
Length	Auger Data			Core Data			Drive Rod Data		Resistivity
	No. of Holes	Footage	Samples	No. of Holes	Footage	Samples	No. of Soundings	Footage	No. of Locations
0.74	15	282.0	65	—	—	—	—	—	—

* See Reverse Side


Liberty Center
HEN - 109 - 20.38
BEGIN STA. 1074 + 00
END STA. 1083 + 00
Wabash RR
Dry Creek
SR 109
USR 24
Turkey - foot
Cr.
River
USR 24
SR 110
Maumee
SR 110
HEN - 109 - 18.64
BEGIN STA. 983 + 00
END STA. 1009 + 00
Creek
USR 6
McClure
South Turkeyfoot
HENRY
SR 109
OTBIRR
N.Y. Chi & St.L RR
Cr.
COUNTY
SR 65
Malinta
HEN - 109 - 8.36
BEGIN STA. 439 + 00
END STA. 444 + 00
Turkeyfoot
Ash Run
SR 281

Cpy 12424

SO-8

SUMMARY OF TESTS ON SOIL PROFILE SAMPLES

County, Rt.,No., & Section HEN - 109 - 18.64

7/5

Lab. No. So.-	Sample No.	Station	Depth In Feet	Mechanical Analysis					Physical Charact.			Density		SHTL Class	Remarks
				Agg. %	C Sand %	F Sand %	Silt %	Clay %	L.L.	P.I.	Water Cont. %	Opt.	Max. Dry Wt.		
50926	496	1003+70 ℄	10-15	4	5	14	29	48	31	13	16			A-6a	✓
7	1	1075+70 124	0-5	0	1	0	20	79	42	19	32			A-7-6	✱ ✓
8	2	"	5-10	0	0	0	20	80	48	24	32			A-7-6	✓
9	3	1078+50 124	0-4	0	2	26	32	40	28	11	19			A-6a	✱ ✓
50930	4	"	4-8	0	0	32	38	30	27	6	20			A-4a	● ✓
1	5	"	8-11	0	0	2	22	76	53	25	31			A-7-6	✓
2	6	"	11-16	0	4	10	24	62	35	17	26			A-6b	✓
3	7	"	16-23	4	6	19	23	48	27	11	16			A-6a	✓
4	8	"	23-24	18	39	26	5	12	NP		4			A-1-b	GR ✓
50935	496	"	24-30	5	4	12	27	52	31	13	14			A-6a	✓
52240	1-S	441+30 124	0-5	13	3	11	24	49	43	23	28			A-7-6	✱ ✓
1	2	"	5-9	11	4	12	26	47	41	20	21			A-7-6	✓
2	3	"	9-15	4	5	12	29	50	32	16	16			A-6b	✓

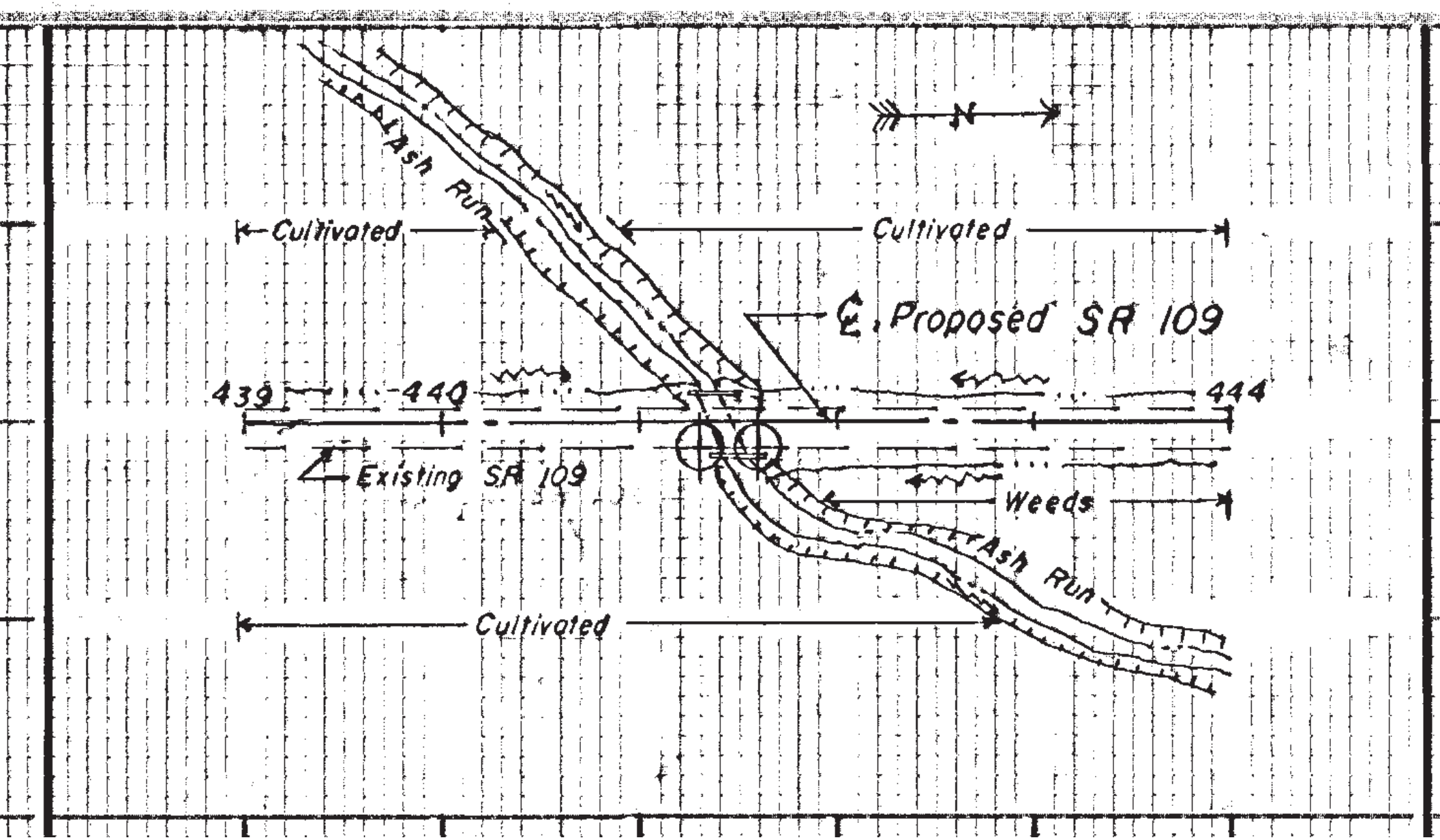
SO-8

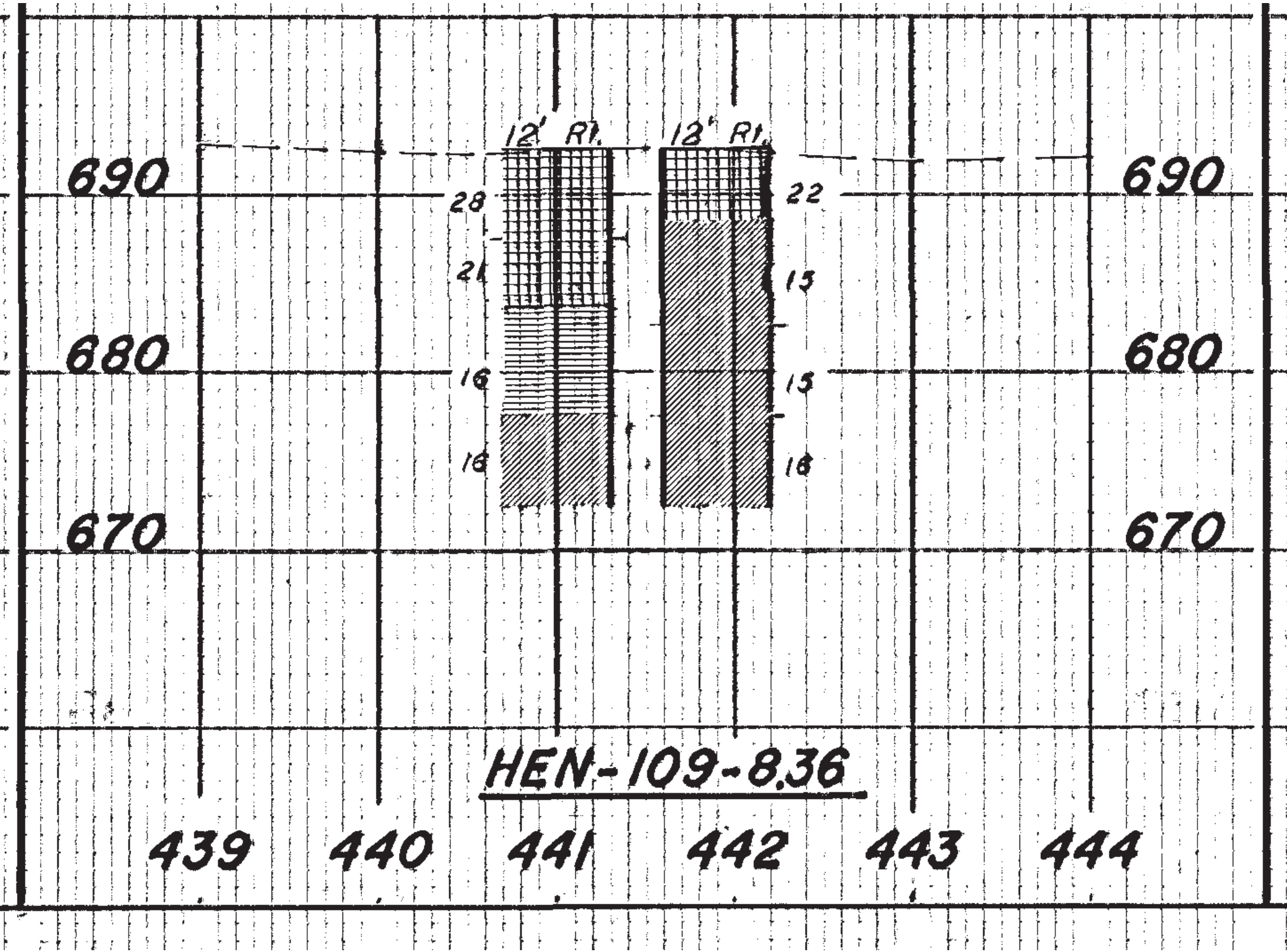
SUMMARY OF TESTS ON SOIL PROFILE SAMPLES

County, Rt.,No., & Section HEN - 109 - 18.64

5/5

Lab. No. So.-	Sample No.	Station	Depth In Feet	Mechanical Analysis					Physical Charact.			Density		SHTL Class	Remarks
				Agg. %	C Sand %	F Sand %	Silt %	Clay %	L.L.	P.I.	Water Cont. %	Opt.	Max. Dry Wt.		
52243	4-S	444+30 12Rt	15-20	2	5	12	29	52	29	11	16			A-6a	✓
4	5	441+60 12Rt	0-4	0	2	19	36	43	42	23	22			A-7-6	✓
5	6	"	4-10	0	7	12	38	43	29	11	15			A-6a	✓
6	7	"	10-15	0	6	13	34	47	28	12	15			A-6a	✓
52247	8-S	"	15-20	6	5	12	26	51	29	13	16			A-6a	✓
52232	1-S	1082+60 12LT	0-6	0	1	0	35	64	33	13	28			A-6a	✓
3	2	"	6-10	0	1	0	32	67	33	15	26			A-6a	✓
4	3	1077+50 12Rt	0-6	0	1	30	35	34	22	6	20			A-4a	✓
5	4	"	6-10	0	2	46	28	24	N.P.					A-4a	✓
6	5	"	10-15	8	4	11	23	34	30	13	20			A-6a	✓
7	6	"	15-20	8	5	14	28	45	27	11	17			A-6a	✓
8	7	"	20-25	6	5	16	29	44	27	12	17			A-6a	✓
52239	8-S	"	25-30	4	6	16	28	46	26	12	16			A-6a	✓


Ash Run
Cultivated
Cultivated
℄ Proposed SR 109
439
440
444
Existing SR 109
Weeds
Ash Run
Cultivated


12' R1.
12' R1.
690
680
670
28
21
16
16
22
13
15
18
690
680
670
HEN-109-8.36
439
440
441
442
443
444