FINAL REPORT
GEOTECHNICAL EXPLORATION REPORT
SUM-77-24.12 GHENT ROAD
SUMMIT COUNTY, OHIO
PID: 111404

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NEAS PROJECT 20-0071

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1. INTRODUCTION

1.1. General

National Engineering & Architectural Services, Inc. (NEAS) presents our Geotechnical Exploration Report for the interstate improvement project (SUM-77-24.12, PID 111404) for Interstate Route 77 (IR-77) and associated ramps within the City of Akron, Summit County, Ohio. The overall project objective is to reduce the congestion along the IR-77 corridor, as well as improve both safety and the infrastructure condition within the project limits. The improvements proposed to accomplish this objective include: 1) the widening of the IR-77 northbound (NB) and southbound (SB) freeway segments within the project limits; 2) the construction/reconstruction of 10 associated ramps (Ramp A, Ramp B, Ramp C, Ramp D, Ramp L, Ramp M, Ramp N, Ramp P, Ramp R, and Ramp S); 3) the construction of a noise wall along the southeastern side of Ramp L; 4) the construction of fifteen new high mast light poles; and, 5) the reconstruction/refurbishment of three existing culverts. This report presents a summary of the project encountered surficial and subsurface conditions and our recommendations for subgrade stabilization, embankment construction, pavement design parameters and noise wall foundation design. The roadway analysis performed as part of this report has been performed in accordance with ODOT's July 2020 revision of *Geotechnical Bulletin 1* (GB1) (ODOT [1], 2020) and *Pavement Design Manual* (PDM) (ODOT, 2020). The noise wall foundation analysis performed as part of this report has been performed in accordance with ODOT's January 2021 revision of the *ODOT's 2020 LRFD Bridge Design Manual* (BDM) (ODOT, 2021).

The exploration was conducted in general accordance with NEAS's proposal to GPD Group (GPD), dated June 2, 2020 and with the provisions of the July 2020 (ODOT, 2020) revisions of ODOT's *Specifications for Geotechnical Explorations* (SGE).

The scope of work performed by NEAS as part of the referenced project included: a review of published geotechnical information; performing 118 total test borings; laboratory testing of soil samples in accordance with the SGE; performing geotechnical engineering analysis to assess subgrade and roadway embankment stabilization requirements, recommended pavement design parameters as well as noise wall drilled shaft foundations; and development of this summary report.

2. GEOLOGY AND OBSERVATIONS OF THE PROJECT

2.1. Geology and Physiography

The majority of the project site is located within the Killbuck-Glaciated Pittsburgh Plateau physiographic region, part of the Glaciated Allegheny (Southern New York) Plateaus, with portions located near lake basin/deposits outside of the Huron-Erie Lake Plains. A small segment (less than 1000 ft) of the southern portion of project site is located within the Akron-Canton Interlobate Plateau which is also a part of the Glaciated Allegheny Plateaus. The Killbuck-Glaciated Pittsburgh Plateau region is characterized by ridges and flat uplands of moderate relief generally above 1,200 ft, covered with thin drift and dissected by steep valleys. Valley segments alternate between broad drift-filled and narrow rock-walled reaches. Elevations of the region ranges from 600 to 1,505 ft above mean sea level (amsl), with moderate relief (200 ft). The geology within this region is described as thin to thick Wisconsinan-age clay to loam till over Mississippian- and Pennsylvanian-age shales, sandstones, conglomerates and coals. The lake basin/deposits are characterized as extremely flat plains often comprised of sandy beach ridges and dunes formed along the shore of ancient lakes. The Akron-Canton Interlobate Plateau is characterized as a moderate relief,

hummocky area between two converging glacial lobes dominated by kames, kame terraces, eskers, kettles, kettle lakes, and bogs/fens. Soils in this region are characteristically sandy Wisconsinan-age clay to loam till over Mississippian- and Pennsylvanian-age shales, sandstones, conglomerates and coals (ODGS, 1998).

The geology in the southern portion of the project site, south of about Shade Road (Rd), is mapped as an average of 100 ft of ice-contact deposits atop up to 320 ft of complexly interbedded deposits of clay, silt, sand, gravel and till all over Devonian-age Ohio Shale bedrock. Areas of Holocene-age organic deposits are also mapped throughout the region. The ice-contact deposits are generally described as highly variable deposits of poorly sorted, Wisconsinan-age gravel and sand with inclusions of silt, clay and till lenses deposited directly from stagnant ice as kame or esker landforms. The northern portion of the project site, north of about Shade Rd, is mapped as an average of 20 ft of till over Mississippian-age sandstone and shale. The till in this region is generally described as consisting of an unsorted mix of Wisconsinan-age clay, silt, gravel and boulders with possible silt, sand and gravel lenses. The till was deposited directly from the ice of several separate advances and may be older than Wisconsinan in buried valleys and thicker areas.

Based on the Bedrock Geologic Units Map of Ohio (USGS & ODGS, 2005), bedrock within the majority of the project area consists of Mississippian Maxville Limestone as well as the undivided Rushville, Logan and Cuyhoga formations. The bedrock of these formations are described as interbedded siltstone, shale and sandstone with minor constituents of conglomerate and limestone. The major constituents are described as being various shades of gray and yellow to brown in color weathering to similar colors. The sandstone in this formation is described as silty to granular with local strings of quartz pebbles while the shale is described as clayey to silty and locally fossiliferous. In another area for the site, from approximately 1000 ft northeast of North Cleveland Massillon Rd to about 350 ft southwest of Yellow Creek Rd along IR-77, bedrock is mapped as a combination of Devonian-age undivided Berea Sandstone, Bedford Shale bedrock, and Devonian-age Ohio Shale bedrock. The Berea Sandstone is described as brown in color weathering to light brown to reddish brown, with siltstone interbeds in the lower portion. The Bedford Shale is described as gray to brown and locally reddish brown in color while the Ohio Shale is described as brownish black to greenish gray in color weathering to brown that is carbonaceous to clayey. According to the ODNR bedrock topography map of Ohio, bedrock elevations at the project site can be expected to range from 1150 ft to 600 ft amsl. Therefore, bedrock is anticipated to range from a depth of 12 ft to a depth of 400 ft below ground surface (bgs).

The majority of soils directly underlying project site have been mapped (Web Soil Survey) by the Natural Resources Conservation Service as being Udorthents. Udorthents are soils that have been disturbed by cutting or filling and are not rated for local roads. Though udorthents was mapped as the dominant unit underlying the project site, various other soil series were mapped within or adjacent to the project boundaries. Of these units, the most dominant included the Rittman silt loam, Chili loam and gravelly loam, Wadsworth silt loam, Mahoning silt loam and Ellsworth silt loam. The Rittman, Wadsworth, Mahoning and Ellsworth series (mapped within or adjacent to about 35 percent of the project area) are all characteristically similar and are described as very deep, moderately well to somewhat poorly drained soils formed in Wisconsinan-age low lime till on till plains. Some pedons (overburden units) of these series are noted as having a thin mantel of loess or other silty material. The till in the Mahoning and Ellsworth series are characterized as deriving from primarily shale and siltstone with minor amounts of limestone and crystalline rocks. Soils within these series are predominantly fine-grained cohesive soil that classify as A-4, A-6 and A-7 type soils according to the AASHTO method of soil classification. The Chili series (mapped within or adjacent to about 6 percent of the project area) is described as very deep, well drained soils formed in Wisconsinan-age outwash deposits on outwash plains, terraces, kames and beach ridges, mainly of non-calcareous sandstone and shale with a large amount of quartz gravel. Soils within this series are

commonly mantled with silt and consist of both coarse- and fine-grained non-cohesive soil that classify as A-1, A-2 and A-4 type soils (AASHTO method of soil classification). Other less dominant (i.e., less than 1 percent) series mapped within or adjacent to the project boundaries include the Canfield, Carlisle, Conotton-Oshtemo, Fitchville, Lodbell, Loudonville, Olmsted, Sebring, and Wheeling series (USDA, 2015).

2.2. Hydrology/Hydrogeology

Groundwater elevations throughout the project site are anticipated to vary throughout the length of the project with exception being the portion of the project located in close proximity to Yellow Creek. Based on the potentiometric surface map of Ohio, groundwater throughout the project site generally decreases in elevation approaching Yellow Creek, where the groundwater elevation is expected to be near the elevation of Yellow Creek. Groundwater elevation decreases from approximate elevations of 1,150 ft amsl and 1,000 ft amsl near the project's northern and southern boundaries, respectively, to a minimum groundwater elevation near Yellow Creek of approximately 850 ft amsl. It should be noted that perched groundwater systems may also exist due to the presence of fine-grained soils making it difficult for groundwater to permeate to the natural phreatic surface.

Portions of the project within about 50 ft of Yellow Creek are located within a 0.2% and 1% Annual Chance Flood Hazard area. Based on available mapping by the Federal Emergency Management Agency's (FEMA) National Flood Hazard mapping program (FEMA, 2016), Yellow Creek is noted as a regulatory floodway with a 1% Annual Chance Flood elevation ranging from about 885 to 890 ft amsl within the flood hazard area.

2.3. Mining and Oil/Gas Production

No abandoned mines are noted on ODNR's Abandoned Underground Mine Locator within the immediate vicinity of the project's boundaries (ODNR [1], 2016).

Five (5) oil and gas wells were noted on ODNR's Ohio Oil & Gas Locator within the immediate vicinity of the project's boundaries (within 300 ft of existing roadways/ramps). The first oil and gas well (API Well No. 34153226610000) is located near the western boundary of the project, approximately 880 ft south of Yellow Creek Rd and approximately 200 ft west of IR-77. The second and third wells (API Well Nos. 34153227880000 and 34153228690000) are located near the eastern boundary of the project, with the wellheads about 210 ft north of and 100 ft north of Yellow Creek Rd, respectively and about 235 ft east of and 275 ft east of IR-77, respectively. These first three identified wells were drilled to depths ranging from 3,631 to 4,215 ft bgs with the most recent production being recorded in 2015. The fourth well (API Well No. 34153227360000) is located near the western boundary of the project, approximately 200 ft north of Martadale Dr and approximately 100 ft west of IR-77. The fifth well (API Well No. 34153220510000) is located near the western boundary of the project, approximately 1000 ft south of Shade Rd and approximately 260 ft west of IR-77. These last two identified wells were drilled to depths ranging from 3,709to 3,717 ft bgs and are noted as currently producing (ODNR [2], 2016). More information on the identified wells can be found on the ODNR Oil Well reports included within Appendix A.

2.4. Historical Records and Previous Phases of Project Exploration

A historic record search was performed through ODOT's Geotechnical Data Management System (GeoMS) and the following report/plans were available for review and evaluation for this report:

- Soil Profile Sheets for the ODOT project SUM-21-4.31, prepared by the State of Ohio Department of Highways State Testing Laboratory, dated November 16, 1955;
- Soil Profile Sheets, Structure Foundation Investigations and Geotechnical Exploration Findings for the ODOT project SUM-21-11.42, prepared by the State of Ohio Department of Highways State Testing Laboratory, dated March 22, 1961 and May 22, 1961;
- Soil Profile Sheets and Geotechnical Exploration Findings for the ODOT project SUM-18-1.31, prepared by the State of Ohio Department of Highways, submitted on July 16, 1963 and August 15, 1963;
- Soil Profile Sheets and Geotechnical Exploration Findings for the ODOT project SUM-77-19.85, prepared by the State of Ohio Department of Highways State Testing Laboratory, submitted on July 1, 1969 and July 3, 1969;
- Final Slope Stability Report, Stabilization Recommendations and Structure Foundation Exploration Sheets for Bridge SUM-77-40.538L&R over Yellow Creek as part of the ODOT Project SUM-77-24.19 prepared by BBC&M Engineering, Inc., dated May 28, 1999 and October 9, 2000;
- Structure Foundation Exploration Sheets for Bridge SUM-77-41.954L&R over Bath Road as part of ODOT project SUM-77-41.954 prepared by Prime Engineering and Architecture, Inc., dated August 14, 2000;

Historical soil borings associated with the above plans were reviewed, however, the available information was not utilized for our evaluation of the site. The information was not utilized because the subject project is primarily a pavement replacement project and boring information of the previous projects subgrade and pavement buildups have a high probability of change between various projects and maintenance over the years. Therefore, this historical information are not referenced or presented within this report.

2.5. Field Reconnaissance

A field reconnaissance visit for the overall project area was conducted between August 18, 2020 and August 21, 2020. The reconnaissance was performed along IR-77, the associated Ghent Rd ramps (Ramp L, Ramp M, Ramp M, Ramp P, Ramp R, and Ramp S) and the associated Roadside Rest Area ramps (Ramp A, Ramp B, Ramp C, and Ramp D). Site conditions, including the existing pavement conditions, were noted and photographed during the visit. Photographs of notable pavement distress and a summary of our observations by roadway segment are provided below.

2.5.1. Land Use and Cover

The land use of most of the project area consists of a combination of wooded and residential properties. Other land uses of the area surrounding the project include: 1) industrial facilities; 2) commercial properties; and 3) institutional facilities. Additionally, east of IR-77 from about 1,000 ft north of the IR-77/Ghent Rd intersection to the end of the project, high voltage electrical lines with associated electrical towers and tree cleared grass lands are present.

2.5.2. IR-77 from Beginning of Project to Ghent Road

In general, the pavement condition along this section of IR-77 was observed to be fair with various signs of weathering and surface wear. Moderate severity longitudinal and transverse cracking was frequent along this section, as well as occasional moderate severity patching and potholing (Photograph 1). The roadway drains to open drainage swales on either side of the roadway as well as to an apparent lowland in the median between IR-77 northbound (NB) and southbound (SB) just south Ghent Rd. The indicated lowland area is heavily vegetated with signs of long-term standing water observed (i.e., cattails and other vegetation)

(Photograph 2). This area appeared to drain to a culvert that runs under the NB lanes of IR-77 to another low-lying area to the east of IR-77 (Photograph 3). The inlet of the culvert was not visible due to the large amount of vegetation. In general, this area appeared to be stable with no apparent signs of instability observed during our visit.

Photograph 1: Pavement transition at beginning of project

Photograph 2: Drainage area in median

Photograph 3: Culvert directing drainage from median to east of IR-77 NB

2.5.3. IR-77 From Ghent Road to Ira Road

In general, the pavement condition along this section of IR-77 was observed to be fair to good with few signs of weathering and surface wear. Occasional moderate severity longitudinal and transverse cracking was observed along this section as well as moderate severity patching and crack sealing deficiencies. The wearing courses of the bridges in this section appear to be in good condition with very few signs of surface wear. This section of IR-77 from just north of Ghent Rd to Ira Rd includes various transitions between cut sections and fill section before leveling out with the surrounding area just south of Ira Rd. The cut and fill slopes along this segment range from about 2 Horizontal:1 Vertical (2H:1V) to about 3H:1V. Both cut and fill slopes along this segment appeared to be stable with no apparent signs of instability noted during our visit. IR-77 along this segment appears to drain to open drainage swales on the outside shoulders of the highway as well as to drainage basins in the median, where present. Drainage swales were observed to be vegetated with the exception of a small section of a concrete lined drainage swale on the east side of IR-77 NB, about halfway between Shade Rd and Ira Rd (Photograph 4). The pavement section along IR-77 from just north of Ghent Rd to Ira Rd was observed to be well drained with no signs of standing water in the roadway.

Photograph 4: Paved drainage swale between Shade Road and Ira Road

2.5.4. IR-77 from Ira Road to End of Project

In general, the pavement condition along this section of IR-77 was observed to be fair to good with minor signs of weathering and surface wear. Occasional light severity longitudinal and transverse cracking was observed along this section as well as occasional moderate severity patching and raveling. With the exception of the portion of IR-77 just north of the Ira Rd overpass, IR-77 SB is relatively level with the surrounding area while, IR-77 NB is supported on a relatively small embankment with side slopes of about 3H:1V. Immediately north of Ira Rd, the interstate is supported on embankment leading up to the Ira Rd overpass, with embankment slopes of about 2H:1V. Embankment slopes along this segment were observed to be stable with no apparent signs of instability noted during our visit. Similar to the other segments of IR-77 within the project area, this segment of interstate directed drainage to open vegetated swales on the outside shoulders of the highway as well as to drainage basins in the median.

2.5.5. Ramp L, Ramp M, Ramp N, Ramp P, Ramp R, and Ramp S

In general, the pavement condition along the Ghent Rd and IR-77 interchange ramps was observed to be fair to good with various signs of weathering and surface wear. Frequent low to moderate severity longitudinal and transverse cracking and moderate to high severity map cracking, edge cracking and crack sealing deficiencies, and occasional moderate severity patching was observed along these ramp sections (Photograph 5). The referenced ramps all sit atop embankments with side slopes ranging from 2H:1V to flatter than 4H:1V. The exception to this is Ramp L (IR-77 NB exit ramp to Ghent Rd), which is also the ramp which the proposed Noise Wall is planned to approximately parallel, that follows the natural rise in terrain up to Ghent Rd. Embankment and natural slopes along these segment were observed to be stable with no apparent signs of instability noted during our site visit. The referenced ramp segments appeared to drain to open vegetated drainage swales on either side of the ramp as well as to large vegetated areas in between the ramps and/or interstate. Some signs of standing water were observed in these areas (i.e., cat tails) though no sign of standing water on the ramps were observed.

Photograph 5: Pavement condition of IR-77 NB ramp from Ghent Road (Ramp M)

2.5.6. Ramp A, Ramp B, Ramp C and Ramp D

In general, the pavement condition along the IR-77 NB entrance and exit ramps to the Roadside Rest Stop (Ramps A and B) was observed to be fair with various signs of weathering and surface wear. Frequent moderate severity longitudinal and transverse cracking was observed along this section, as well as

occasional moderate severity map cracking and potholing (Photograph 6). The pavement condition along the IR-77 SB entrance and exit ramps (Ramps C and D) was observed to be poor with more severe signs of weathering and surface wear. Frequent moderate severity longitudinal and transverse cracking was observed along this section as well as occasional high severity rutting, patching, bleeding and map cracking (Photograph 7). The referenced rest stop ramps are supported by embankment at the approximate level of the interstate and slope downward to the rest stop elevation which is more consistent with that of the surrounding area. The indicated embankments were observed to have side slopes of about 2H:1V and appeared stable with no apparent signs of instability noted during our visit. The ramps appeared to drain to open vegetated drainage swales on both sides of the ramp as well as to catch basins in the grassy areas between the rest stop and IR-77. Though signs of standing water (i.e., cattails) were observed in areas adjacent to the ramps, no sign of ponding within the ramp pavement was observed.

Photograph 6: Pavement condition along IR-77 NB entrance ramp from Roadside Rest Stop (Ramp B)

Photograph 7: Pavement condition along IR-77 SB entrance ramp from Roadside Rest Stop (Ramp D)

3. GEOTECHNICAL EXPLORATION

3.1. Exploration Program

The subsurface exploration was conducted by NEAS and GPD between August 8, 2020 and February 2, 2022 and included 118 borings drilled to depths between 6 and 52.0 ft bgs. The boring locations were selected by NEAS in general accordance with the guidelines contained in the SGE with the intent to evaluate subsurface soil and groundwater conditions. Borings were typically located either within existing pavement areas that are planned to undergo full-depth replacement, within areas where widening and/or realignment is planned, at proposed high mast lighting locations, and at culvert locations where jack and bore drilling may be performed. Target boring locations were located in the field by NEAS or GPD prior to drilling and the boring locations were drilled in areas that were not restricted by underground utilities or dictated by terrain (i.e. steep embankment slopes). Each as-drilled project boring location and corresponding ground surface elevation was surveyed in the field following drilling. Each individual project boring log (included within Appendix C) includes the recorded boring latitude and longitude location (based on the surveyed Ohio State Plane North, NAD83, location) and the corresponding ground surface elevation. The boring locations are depicted within the boring location plan provided in Appendix B. It should be noted that a number of borings were drilled for a project structure (i.e., noise wall) but can serve as both structure and roadway borings and therefore, are included within this report.

Borings were drilled using either a CME 55X track-mounted or a CME 45B truck-mounted drilling rig utilizing 3.25-inch (inner diameter) hollow stem augers. Soil samples for subgrade borings were typically recovered continuously to a depth of 7.5 ft bgs, while samples for structure borings were typically recovered at 2.5-ft intervals, each using an 18-inch split spoon sampler (AASHTO T-206 “Standard Method for Penetration Test and Split Barrel Sampling of Soils.”). Samples from joint subgrade (Type A) and structure borings (Type E4) were typically recovered continuously to a depth of 7.5 ft bgs then at 2.5-ft intervals thereafter. The soil samples obtained from the exploration program were visually observed in the field by the NEAS/GPD field representative and preserved for review by a Geologist for possible laboratory testing. Standard penetration tests (SPT) were conducted using CME auto hammers that have been calibrated on December 5, 2019 or January 26, 2022, to be between 67.6% and 81.9% efficient as indicated on the boring logs (Appendix C).

Field boring logs were prepared by drilling personnel and included pavement description (where present), lithological description, SPT results recorded as blows per 6-inch increment of penetration and estimated unconfined shear strength values on specimens exhibiting cohesion (using a hand-penetrometer). Groundwater level observations were recorded both during and after the completion of drilling. These groundwater level observations are included on the individual boring logs (provided in Appendix C). After completing the borings, the boreholes were backfilled with either auger cuttings, bentonite chips, or a combination of these materials and patched accordingly with cold patch asphalt and/or cement when drilled through the roadway.

3.2. Pavement Coring Exploration Program

The coring exploration program for this project was conducted by NEAS between November 17, 2020 and December 16, 2020 and included a total of sixteen (16) pavement cores. Pavement cores were obtained at four (4) project boring locations (B-014-0-20, B-029-0-20, B-042-0-20 and B-057-0-20) performed through the existing pavement. In addition to the cores obtained at the indicated boring locations, four (4) additional cores were taken within the bridge approach shoulders of each of the following bridges: IR-77 over Yellow Creek Rd/Yellow Creek, IR-77 over West Bath Rd, and IR-77 over Ira Rd. As described in

Section 3.1. of this report, the indicated target boring/coring locations were located in the field by NEAS prior to drilling utilizing handheld GPS equipment in areas that were not restricted by maintenance of traffic efforts or utilities. Measurements, location information, photographs and other details of each core sample can be found in the Pavement Core Logs included within Appendix D. The approximate location for each core is depicted on the Boring Location Plan provided in Appendix B.

Cores were drilled using a portable, truck-mounted, electric powered coring drill with a 4-inch (outer diameter) diamond tipped drill bit and utilizing water as the circulating fluid. Asphalt and concrete thicknesses were measured in the field after the cores were extracted and down-hole measurements were made. Each core sample was then photographed, logged, and stored for transportation to NEAS's laboratory. Following field documentation and photographs, the core hole was backfilled to existing grade with either asphalt patch or concrete (as appropriate). Once in the laboratory the cores were: 1) re-measured for thickness verification and photographed; 2) checked for composition; and, 3) reviewed for individual layer identification and subsequent measurements.

3.3. Laboratory Testing Program

The laboratory testing program consisted of classification testing, moisture content determinations, organic content loss on ignition, sulfate content testing and one-dimensional consolidation testing. Data from the laboratory testing program were incorporated onto the boring logs (Appendix C). Soil samples are retained at the laboratory for 60 days following report submittal, after which time they will be discarded.

3.3.1. Classification Testing

Representative soil samples were selected for index property (Atterberg Limits) and gradation testing for classification purposes on approximately 40% of the samples. At each subgrade boring location, the upper two samples obtained below the proposed top of subgrade elevation were generally tested while additional samples were selected for testing with the intent of properly classifying the subsurface soil and groundwater conditions within the planned project limits. Soils not selected for testing were compared to laboratory tested samples/strata and classified visually. Moisture content testing was conducted on all samples. The laboratory testing was performed in general accordance with applicable AASHTO specifications and ODOT Supplements.

Final classification of soil strata in accordance with AASHTO M-145 "Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes," as modified by ODOT "Classification of Soils" was made once laboratory test results became available. The results of the soil classification are presented on the boring logs in Appendix C.

3.3.2. Standard Penetration Test Results

Standard Penetration Tests (SPT) and split-barrel (commonly known as split-spoon) sampling of soils were performed at varying intervals (i.e., continuous, 2.5-ft, or 5-ft intervals) in the project borings performed. To account for the high efficiency (automatic) hammers used during SPT sampling, field SPT N-values were converted based on the calibrated efficiency (energy ratio) of the specific drill rig's hammer. Field N-values were converted to an equivalent rod energy of 60% (N_{60}) for use in analysis or for correlation purposes. The resulting N_{60} values are shown on the boring logs provided in Appendix C.

3.3.3. Organic Content Loss on Ignition

Organic Content Loss on Ignition testing (LOI) was performed on two samples (SS-1 and SS-4) from boring B-095-0-20 and one undisturbed sample (ST-1) from boring B-093-0-20, each of which were performed for embankment/roadway design purposes. The selected samples were tested in accordance with AASHTO T267 "Standard Method of Test for Determination of Organic Content in Soils by Loss on Ignition". The samples were found to have an organic content ranging from 3.4% to 8.2%. Per the SGE, an organic content greater than 10% is considered highly organic. A summary of the LOI laboratory testing results are provided in Table 1 below while the lab testing report of the LOI tests is presented within Appendix C.

Table 1: Summary of Organic Content Loss on Ignition Testing

Boring ID	Sample	Depth (ft)	Moisture Content (%)	Organic Content (%)
B-095-0-20	SS-1	2.5 - 4.0	20	4.1
B-095-0-20	SS-4	10.0 - 11.5	28	8.2
B-093-0-20	ST-1	13.5 - 13.8	19	3.4

3.3.4. Consolidation Testing

Two (2) consolidation tests were performed in accordance with ASTM D 2435-04 "Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading" on relatively undisturbed cohesive soil samples collected from borings B-093-0-20 and B-097-0-20; the results of the tests are presented in Table 2 below, while the laboratory testing report is included within Appendix C.

Table 2: Summary of Consolidation Testing

Boring Number	Depth (ft)	Elevation (ft)	Compression Index (Cc)	Recompression Index (Cr)	Preconsolidation Pressure (psf)	Initial Void Ratio
B-093-0-20	13.5 - 13.6	997.8 - 997.7	0.102	0.006	3,500	0.564
B-097-0-20	10.6 - 10.7	983.0 - 982.9	0.063	0.011	5,500	0.474

3.3.5. Sulfate Testing

Sulfate testing was generally performed on one sample for each subgrade/roadway boring performed for pavement/subgrade design purposes. The selected samples were tested in accordance with ODOT Supplement 1122, "Determining Sulfate Content in Soils" dated July 17, 2015. In general, the upper most sample (within 3 ft of the proposed subgrade elevation) from each boring was tested when feasible. Testing results are summarized in Table 3 below, provided in Appendix E and presented on the boring logs within Appendix C.

Table 3: Sulfate Test Summary by Boring

Boring ID	Sample	Depth (ft)	Dilution Ratio	Average Sulfate Content (ppm)	Boring ID	Sample	Depth (ft)	Dilution Ratio	Average Sulfate Content (ppm)
B-001-0-20	SS-1A	1.5 - 2.7	20	53	B-048-0-20	SS-1	1.5 - 3.0	20	113
B-002-0-20	SS-1	1.5 - 3.0	20	53	B-049-0-20	SS-1	0.0 - 1.5	20	487
B-003-0-20	SS-1	0.0 - 1.5	20	0	B-050-0-20	SS-1	1.5 - 3.0	20	73
B-004-0-20	SS-1	1.5 - 3.0	20	67	B-051-0-20	SS-1	1.5 - 3.0	20	67
B-005-0-20	SS-1	0.0 - 1.5	20	13	B-052-0-20	SS-1	1.5 - 3.0	20	67
B-006-0-20	SS-1	0.0 - 1.5	20	20	B-053-0-20	SS-1	0.0 - 1.5	20	67
B-007-0-20	SS-1	1.5 - 3.0	20	147	B-054-0-20	SS-1	0.0 - 1.5	20	20
B-008-0-20	SS-1	1.5 - 3.0	20	53	B-055-0-20	SS-1	0.0 - 1.5	20	120
B-009-0-20	SS-1	1.5 - 3.0	20	253	B-056-0-20	SS-1	0.0 - 1.5	20	347
B-010-0-20	SS-1	0.0 - 1.5	20	173	B-057-0-20	SS-1	1.5 - 3.0	20	80
B-011-0-20	SS-1	1.5 - 3.0	20	133	B-058-0-20	SS-1	1.5 - 3.0	20	107
B-012-0-20	SS-1	1.5 - 3.0	20	47	B-059-0-20	SS-1	1.5 - 3.0	20	107
B-013-0-20	SS-1	0.0 - 1.5	20	113	B-061-0-20	SS-2	1.5 - 3.0	20	0
B-014-0-20	SS-1	1.5 - 3.0	20	73	B-062-0-20	SS-1	1.5 - 3.0	20	20
B-015-0-20	SS-1	0.0 - 1.5	20	13	B-063-0-20	SS-1	0.0 - 1.5	20	140
B-016-0-20	SS-1	1.5 - 3.0	20	20	B-064-0-20	SS-1	1.5 - 3.0	20	40
B-017-0-20	SS-1	0.0 - 1.5	20	40	B-065-0-20	SS-1	1.5 - 3.0	20	20
B-018-0-20	SS-1	1.5 - 3.0	20	40	B-066-0-20	SS-1	1.5 - 3.0	20	60
B-019-0-20	SS-1A	1.5 - 2.0	20	87	B-067-0-20	SS-1	1.5 - 3.0	20	40
B-020-0-20	SS-1	1.5 - 3.0	20	140	B-068-0-20	SS-1	1.5 - 3.0	20	827
B-021-0-20	SS-1	1.5 - 3.0	20	20	B-069-0-20	SS-1	1.5 - 3.0	20	33
B-022-0-20	SS-1	0.0 - 1.5	20	120	B-070-0-20	SS-1	1.5 - 3.0	20	20
B-023-0-20	SS-1	1.5 - 3.0	20	113	B-071-0-20	SS-1	1.5 - 3.0	20	33
B-024-0-20	SS-1A	0.0 - 1.0	40	1973	B-072-0-20	SS-1	1.5 - 3.0	20	280
B-025-0-20	SS-2	3.0 - 4.5	20	107	B-074-0-20	SS-1	1.5 - 3.0	20	127
B-026-0-20	SS-1	0.0 - 1.0	20	113	B-075-0-20	SS-1	1.5 - 3.0	20	313
B-027-0-20	SS-1	0.0 - 1.0	20	13	B-076-0-20	SS-1	1.5 - 3.0	20	100
B-028-0-20	SS-1	1.5 - 3.0	20	73	B-078-0-20	SS-1	1.5 - 3.0	20	93
B-029-0-20	SS-1	1.5 - 3.0	20	80	B-079-0-20	SS-1	1.5 - 3.0	20	313
B-030-0-20	SS-1	0.0 - 1.5	100	5467	B-080-0-20	SS-1	1.5 - 3.0	20	20
B-032-0-20	SS-1	0.0 - 1.5	20	87	B-081-0-20	SS-1	1.5 - 3.0	20	20
B-033-0-20	SS-1	1.5 - 3.0	20	1360	B-082-0-20	SS-1	1.5 - 3.0	20	127
B-034-0-20	SS-1	1.5 - 3.0	20	307	B-084-0-20	SS-1	1.5 - 3.0	20	7
B-035-0-20	SS-1	0.0 - 1.5	20	193	B-085-0-20	SS-1	1.5 - 3.0	20	60
B-036-0-20	SS-1	0.0 - 1.5	20	40	B-086-0-20	SS-2	1.5 - 3.0	20	33
B-037-0-20	SS-1	1.5 - 3.0	20	380	B-087-0-20	SS-1	1.5 - 3.0	40	1200
B-038-0-20	SS-1	0.0 - 1.5	20	160	B-088-0-20	SS-1	1.5 - 3.0	20	93
B-039-0-20	SS-1	0.0 - 1.5	20	233	B-089-0-20	SS-2	1.5 - 3.0	20	107
B-040-0-20	SS-1	1.5 - 3.0	20	40	B-090-0-20	SS-2	1.5 - 3.0	20	167
B-041-0-20	SS-1	0.0 - 1.5	20	80	B-091-0-20	SS-1	1.5 - 3.0	20	167
B-042-0-20	SS-1	1.5 - 3.0	20	147	B-092-0-20	SS-1	2.5 - 4.0	20	313
B-043-0-20	SS-1	1.5 - 3.0	20	80	B-093-0-20	SS-1	2.5 - 4.0	20	93
B-044-0-20	SS-1	0.0 - 1.5	20	67	B-094-0-20	SS-1	2.5 - 4.0	20	80
B-045-0-20	SS-1	0.0 - 1.5	20	173	B-095-0-20	SS-1	2.5 - 4.0	40	1760
B-046-0-20	SS-1	1.5 - 3.0	20	113	B-096-0-20	SS-2	2.5 - 4.0	20	187
B-047-0-20	SS-2	0.0 - 1.5	20	113	B-097-0-20	SS-1	2.5 - 4.0	20	13

4. FINDINGS

The subsurface conditions encountered during NEAS's explorations are described in the following subsections and/or on each boring log presented in Appendix C. The boring logs represent NEAS's interpretation of the subsurface conditions encountered at each boring location based on our site observations, field logs, visual review of the soil samples by NEAS's geologist, and laboratory test results. The lines designating the interfaces between various soil strata on the boring logs represent the approximate

interface location; the actual transition between strata may be gradual and indistinct. The subsurface soil and groundwater characterizations included herein, including summary test data, are based on the subsurface findings from the geotechnical explorations performed by NEAS as part of the referenced project. At the time of this report, pavement grade information has been assumed to be consistent with preliminary proposed roadway grades found within digital design models developed by GPD and accessed on January 12, 2021. It should be noted that for the purposes of this report and our analysis the term 'subgrade' has been assumed to represent soils and/or soil conditions from 1.5 ft below proposed final pavement grades to a depth of 7.5 ft below the proposed pavement grades.

4.1. Core Results

Thickness measurements were obtained for each of the indicated pavement cores performed for the project. A summary of these measurements along with the material encountered and the associated boring location at which the pavement core was obtained (where applicable) is summarized in Table 4. Laboratory photographs and measurements of each of the cores are presented within the Pavement Core Logs included within Appendix D. Locations of the pavement cores or the boring locations where pavement cores were performed are depicted on the Boring Location Plan included within Appendix B.

Table 4: Pavement Core Summary

Core ID	Alignment	Asphalt Thickness (in)	Concrete Thickness (in)	Total Thickness (in)
B-014-0-20 / PC-1	IR-77 SB	6.25	-	6.25
PC-2	IR-77 (SB Shoulder)	12.50	0.25	12.75
PC-3	IR-77 (SB Shoulder)	3.50	6.75	10.25
PC-4	IR-77 (NB Shoulder)	14.75	-	14.75
PC-5	IR-77 (NB Shoulder)	12.75	-	12.75
B-029-0-20 / PC-6	IR-77 (NB Shoulder)	5.75	-	5.75
PC-7	IR-77 (SB Shoulder)	11.75	0.75	12.50
PC-8	IR-77 (SB Shoulder)	15.25	-	15.25
PC-9	IR-77 (NB Shoulder)	14.75	-	14.75
PC-10	IR-77 (NB Shoulder)	14.00	-	14.00
B-042-0-20 / PC-11	IR-77 (SB Shoulder)	6.50	-	6.50
PC-12	IR-77 (SB Shoulder)	12.25	-	12.25
PC-13	IR-77 (SB Shoulder)	6.25	-	6.25
PC-14	IR-77 (NB Shoulder)	10.25	-	10.25
PC-15	IR-77 (NB Shoulder)	14.25	-	14.25
B-057-0-20 / PC-16	IR-77 (NB Shoulder)	12.25	-	12.25

4.2. Existing Pavement

The pavement section thicknesses in terms of asphalt, concrete and granular base were measured at representative project subgrade borings during the subsurface exploration for the project and are recorded on the test boring logs provided in Appendix C. A summary of these measurements is provided in Table 5 below.

Table 5: Measured Pavement Thickness at Boring Locations

Boring ID	Proposed Alignment	Drilled Depth (ft)	Asphalt Thickness (in)	Concrete Thickness (in)	Base Thickness (in)	Total Thickness (in)	Boring ID	Proposed Alignment	Drilled Depth (ft)	Asphalt Thickness (in)	Concrete Thickness (in)	Base Thickness (in)	Total Thickness (in)
B-001-0-20	IR-77 NB	7.5	10.0	0.0	8.0	18.0	B-064-0-20	IR-77 SB	7.5	10.0	0.0	5.0	15.0
B-004-0-20	IR-77 SB	7.5	12.0	0.0	6.0	18.0	B-065-0-20	Ramp S	7.5	10.0	0.0	4.0	14.0
B-007-0-20	IR-77 NB	26.5	10.0	0.0	6.0	16.0	B-066-0-20	Ramp S	7.5	8.0	0.0	7.0	15.0
B-008-0-20	IR-77 SB	7.5	10.0	0.0	6.0	16.0	B-067-0-20	Ramp S	7.5	8.0	0.0	6.0	14.0
B-009-0-20	IR-77 NB	7.5	12.0	0.0	4.0	16.0	B-068-0-20	Ramp P	7.5	8.0	0.0	5.0	13.0
B-012-0-20	IR-77 SB	7.5	12.0	0.0	6.0	18.0	B-069-0-20	Ramp P	7.5	8.0	0.0	4.0	12.0
B-014-0-20	IR-77 SB	7.5	6.0	0.0	6.0	12.0	B-070-0-20	Ramp P	7.5	10.0	0.0	6.0	16.0
B-018-0-20	IR-77 SB	7.5	12.0	0.0	6.0	18.0	B-071-0-20	Ramp P	7.5	10.0	0.0	7.0	17.0
B-020-0-20	IR-77 SB	7.5	12.0	0.0	4.0	16.0	B-072-0-20	Ramp R	7.5	9.0	0.0	6.0	15.0
B-021-0-20	IR-77 NB	7.5	11.0	0.0	6.0	17.0	B-073-0-20	Ramp L	26.5	6.0	0.0	7.0	13.0
B-023-0-20	IR-77 NB	7.5	15.0	0.0	0.0	15.0	B-074-0-20	Ramp L	26.5	6.0	0.0	7.0	13.0
B-025-0-20	IR-77	7.5	10.0	0.0	0.0	10.0	B-075-0-20	Ramp L	26.5	6.0	0.0	10.0	16.0
B-028-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-076-0-20	Ramp L	26.5	0.0	0.0	10.0	10.0
B-029-0-20	IR-77	7.5	6.0	0.0	7.0	13.0	B-077-0-20	Ramp L	26.5	0.0	0.0	8.0	8.0
B-033-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-078-0-20	Ramp L	26.5	0.0	0.0	10.0	10.0
B-034-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-079-0-20	Ghent Rd	7.5	6.0	0.0	7.0	13.0
B-037-0-20	IR-77	7.5	9.0	9.0	0.0	18.0	B-080-0-20	Ramp M	7.5	6.0	0.0	7.0	13.0
B-042-0-20	IR-77	6.5	12.0	0.0	6.0	18.0	B-081-0-20	Ramp N	7.5	6.0	0.0	7.0	13.0
B-043-0-20	IR-77	7.5	9.0	0.0	4.0	13.0	B-082-0-20	Ramp N	7.5	6.0	0.0	7.0	13.0
B-048-0-20	IR-77	7.5	12.0	0.0	4.0	16.0	B-083-0-20	IR-77 NB	7.5	6.0	0.0	7.0	13.0
B-050-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-084-0-20	IR-77	7.5	6.0	0.0	0.0	6.0
B-051-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-085-0-20	Ramp D	7.5	11.0	0.0	0.0	11.0
B-052-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-086-0-20	Ramp C	7.5	9.0	0.0	0.0	9.0
B-057-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-088-0-20	Ramp C	7.5	5.0	0.0	8.0	13.0
B-059-0-20	IR-77	7.5	7.0	0.0	6.0	13.0	B-089-0-20	Ramp A	7.5	8.5	0.0	6.0	14.5
B-060-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-090-0-20	Ramp B	7.5	5.0	10.5	0.0	15.5
B-062-0-20	IR-77	7.5	12.0	0.0	6.0	18.0	B-091-0-20	IR-77	7.5	0.0	0.0	11.0	11.0

4.3. Subgrade Conditions

The subgrade conditions within the project limits are relatively consistent and are generally comprised of either fill soils (i.e., embankment fill) or natural soils consisting of gravel, sand and silt, or low to moderately plastic sandy silt and silt/clay combinations. The subgrade soils encountered within the project limits are generally classified as either bedrock, A-1-a, A-1-b, A-2-4, A-2-6, A-3, A-3a, A-4a, A-4b, A-6a, A-6b, A-7-5 or A-7-6 type soils. With respect to sulfate within the subgrade soil, based on the project laboratory testing program, each subgrade soil sample tested was determined to have a sulfate content of less than 5,000 parts per million (ppm) (i.e., lower than the level which ODOT considers high and may prevent the use of chemical stabilization) with the exception of one boring (B-030-0-20) in which a sample was determined to have a sulfate content of 5,500 ppm.

The following subsections present a brief summary of the subsurface conditions by ramp/roadway segment with problem areas highlighted where present.

4.3.1. IR-77 NB & SB

The project portions of IR-77 NB and SB are planned to be widened into the median as well as undergo full depth pavement replacement. The borings performed along this portion of roadway included borings B-001-0-20 through B-063-0-20.

Along IR-77, seventy percent (70%) of the soil samples were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 29% of samples); 2) Silt (A-4b, 3% of samples); 3) Silt and

Clay (A-6a, 25% of samples); 4) Silty Clay (A-6b, 9% of samples); and, 5) Clay (A-7-6, 3% of samples). With respect to the consistency of the fine-grained soils, the descriptions varied from medium stiff to hard correlating to converted SPT-N values (N_{60}) between 5 and 66 blows per foot (bpf). Natural moisture contents ranged from 8 to 28 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along the project portions of IR-77, the liquid and plastic limits ranged from 25 to 43 percent and from 15 to 35 percent, respectively.

Twenty-nine percent (29%) of the samples taken along the proposed roadway were classified as coarse-grained, non-cohesive soils and were comprised of: 1) Gravel (A-1-a, 1% of samples); 2) Gravel with Sand (A-1-b, 6% of samples); 3) Gravel and Stone Fragments with Sand and Silt (A-2-4, 8% of samples); 4) Gravel and Stone Fragments with Sand, Silt and Clay (A-2-6, 2% of samples); and, 5) non-cohesive Sandy Silt (A-4a, 3% of samples). With respect to the relative density of the coarse-grained soils, the descriptions varied from very loose to very dense correlating to N_{60} values between 3 and 82 bpf. Natural moisture contents ranged from 6 to 26 percent.

The remaining one percent (1%) of samples (3 samples) obtained along the project portions of IR-77 were identified as rock that was visually classified as shale. Rock was encountered in boring B-042-0-20.

4.3.2. Ramps A and B

Ramps A and B are the entrance and exit ramps for the IR-77 NB rest area which is planned for full depth pavement replacement. The borings performed along Ramps A and B included borings B-089-0-20 through B-091-0-20.

Eighty-two percent (82%) of the soil samples taken along the proposed ramps were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 18% of samples); and, 2) Silt and Clay (A-6a, 64% of samples). With respect to the consistency of the fine-grained soils, the descriptions varied from stiff to hard correlating to N_{60} values between 10 and 33 bpf. Natural moisture contents ranged from 11 to 31 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along the project portion of Ramps A and B, the liquid and plastic limits ranged from 21 to 33 percent and from 16 to 20 percent, respectively.

Eighteen percent (18%) of the samples taken along the proposed ramps were classified as coarse-grained, non-cohesive soils and were comprised of Gravel and Stone Fragments with Sand and Silt (A-2-4, 2 samples). With respect to the relative density of the coarse-grained soils, the soils can be described as medium dense correlating to N_{60} values of 12 and 14 bpf. Natural moisture contents of the two non-cohesive samples were determined to be 12 and 17 percent.

4.3.3. Ramps C and D

Ramps C and D are the entrance and exit ramps for the IR-77 SB rest area which is planned for full depth pavement replacement. The borings performed along Ramps C and D included borings B-084-0-20 through B-088-0-20.

Seventy-five percent (75%) of the soil samples taken along the proposed ramps were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 10% of samples); 2) Silt and Clay (A-6a, 45% of samples); 3) Elastic Clay (A-7-5, 10% of samples); and, 4) Clay (A-7-6, 10 % of samples). With respect to the consistency of the fine-grained soils, the descriptions varied from medium stiff to very stiff correlating to N_{60} values between 5 and 23 bpf. Natural moisture contents ranged from 11 to 33 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils

obtained along the project portion of Ramps C and D, the liquid and plastic limits ranged from 20 to 69 percent and from 13 to 34 percent, respectively.

Twenty-five percent (25%) of the samples taken along the proposed ramps were classified as coarse-grained, non-cohesive soils and were comprised of: 1) Gravel with Sand (A-1-b, 1 sample); 2) Gravel with Sand and Silt (A-2-4, 2 samples); and, 3) Coarse and Fine Sand (A-3a, 2 samples). With respect to the relative density of the coarse-grained soils, descriptions ranged from loose to medium dense correlating to N_{60} values between 8 and 16 bpf. Natural moisture contents of the non-cohesive samples ranged from 7 to 18 percent.

4.3.4. Ramp L

Ramp L is the IR-77 NB exit ramp to Ghent Rd which are planned for full depth pavement replacement. The borings performed along Ramp L included borings B-073-0-20 through B-078-0-20.

Sixty-three percent (63%) of the soil samples taken along the proposed ramp were identified as fine-grained soils and classified as: 1) cohesive Sandy Silt (A-4a, 32% of samples); 2) Silt and Clay (A-6a, 21% of samples); and, 3) Silty Clay (A-6b, 11% of samples). With respect to the consistency of the fine-grained soils, the descriptions varied from medium stiff to very stiff correlating to N_{60} values between 8 and 26 bpf. Natural moisture contents ranged from 10 to 30 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along the project portions of Ramp L, the liquid and plastic limits ranged from 20 to 40 percent and from 15 to 24 percent, respectively.

Thirty-seven percent (37%) of the samples taken along the proposed ramp were classified as coarse-grained, non-cohesive soils and were comprised of: 1) Gravel and Stone Fragments with Sand and Silt (A-2-4, 2 samples); 2) Gravel with Sand, Silt and Clay (A-2-6, 1 sample); 3) Coarse and Fine Sand (A-3a, 2 samples); and, 4) Sandy Silt (A-4a, 3 samples). With respect to the relative density of the coarse-grained soils, descriptions ranged from loose to medium dense correlating to N_{60} values between 10 and 18 bpf. Natural moisture contents of the non-cohesive samples ranged from 8 to 14 percent.

4.3.5. Ramps M and N

Ramps M and N are the IR-77 NB entrance ramps from Ghent Rd which is planned for full depth pavement replacement. The borings performed along Ramps M and N included borings B-079-0-20 through B-083-0-20.

Sixty-eight percent (68%) of the samples taken along the proposed ramps were classified as coarse-grained, non-cohesive soils and were comprised of: 1) Gravel with Sand (A-1-b, 26% of samples); 2) Gravel with Sand and Silt (A-2-4, 16% of samples); 3) Coarse and Fine Sand (A-3a, 2 samples); and, 4) non-cohesive Sandy Silt (A-4a, 16 % of samples). With respect to the relative density of the coarse-grained soils, the soils can be described as medium dense correlating to N_{60} values between 14 and 25 bpf. Natural moisture contents ranged from 3 to 14 percent.

Thirty-two percent (32%) of the soil samples were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 1 sample); and, 2) Silt and Clay (A-6a, 26% of samples). With respect to the consistency of the fine-grained soils, the descriptions varied from stiff to very stiff correlating to N_{60} values between 10 and 19 bpf. Natural moisture contents ranged from 12 to 23 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along Ramps M and N, the liquid and plastic limits ranged from 23 to 35 percent and from 16 to 20 percent, respectively.

4.3.6. Ramps P and R

Ramps P and R are the IR-77 SB exits ramps to Ghent Rd which are planned for full depth pavement replacement. The borings performed along Ramps P and R included borings B-068-0-20 through B-072-0-20.

Sixty-five percent (65%) of the samples taken along the proposed ramps were classified as coarse-grained, non-cohesive soils and were comprised of: 1) Gravel with Sand (A-1-b, 2 samples); 2) Gravel with Sand and Silt (A-2-4, 25% of samples); 3) Gravel and Stone Fragments with Sand, Silt and Clay (A-2-6, 2 samples); and, 4) Coarse and Fine Sand (A-3a, 20% of samples). With respect to the relative density of the coarse-grained soils, descriptions ranged from loose to very dense correlating to N_{60} values between 7 and 61 bpf. Natural moisture contents ranged from 7 to 18 percent.

Thirty-five percent (35%) of the soil samples were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 25 % of samples); and, 2) Silt and Clay (A-6a, 2 samples). With respect to the consistency of the fine-grained soils, the descriptions varied from medium stiff to very stiff correlating to N_{60} values between 7 and 26 bpf. Natural moisture contents ranged from 10 to 18 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along Ramps P and R, the liquid and plastic limits ranged from 21 to 30 percent and from 14 to 19 percent, respectively.

4.3.7. Ramp S

Ramp S is the IR-77 SB entrance ramp from Ghent Rd which is planned for full depth pavement replacement. The borings performed along Ramp S included borings B-064-0-20 through B-067-0-20.

Sixty-three percent (63%) of the samples taken along the proposed ramp were classified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 35% of samples); 2) Silt and Clay (A-6a, 19% of samples); and, 3) Silty Clay (A-6b, 1 sample). With respect to the consistency of the fine-grained soils, the descriptions varied from stiff to very stiff correlating to N_{60} values between 11 and 23 bpf. Natural moisture contents ranged from 12 to 19 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along Ramp S, the liquid and plastic limits ranged from 22 to 29 percent and from 14 to 19 percent, respectively.

Thirty-seven percent (37%) of the soil samples were identified as fine-grained soils and were comprised of: 1) cohesive Sandy Silt (A-4a, 38% of samples); 2) Silt and Clay (A-6a, 19% of samples); and, 3) Silty Clay (A-6b, 1 sample). With respect to the consistency of the fine-grained soils, the descriptions varied from stiff to very stiff correlating to N_{60} values between 11 and 23 bpf. Natural moisture contents ranged from 11 to 19 percent. Based on Atterberg Limit tests performed on representative samples of the fine-grained subgrade soils obtained along Ramp S, the liquid and plastic limits ranged from 22 to 29 percent and from 14 to 19 percent, respectively.

4.3.8. Groundwater

Groundwater was observed within proposed subgrade depths during drilling in one (1) of the borings (B-003-0-20) performed at the site as part of the roadway exploration. Based on measurements at this boring location groundwater was encountered at a depth of 4.5 ft bgs (elevation 1002.5 ft amsl). It should be noted that groundwater is affected by many hydrologic characteristics in the area and may vary from those measured at the time of the exploration. The specific groundwater readings are included on the individual test boring logs located within Appendix C.

5. ANALYSES AND RECOMMENDATIONS

We understand that reconstruction and widening of the IR-77 mainline freeway segment as well as reconstruction of various adjacent ramps are planned as part of the interchange improvement project (SUM-77-24.12, PID 111404). In addition to the roadway reconstruction and/or widening, the construction of a noise barrier along the southeastern side of the IR-77 NB exit ramp to Ghent Rd (Ramp L) is also planned. For this purpose, a geotechnical exploration and subsequent analysis was completed for the referenced project. The analysis completed for the proposed roadway improvements included a subgrade (GB1) analysis as well as a noise wall drilled shaft foundation analysis. The subgrade analysis was performed in accordance with ODOT's GB1 criteria utilizing the ODOT provided *GB1: Subgrade Analysis Spreadsheet* (GB1_SubgradeAnalysis.xls, Version 14.5 dated January 18, 2019). The noise wall foundation analysis was performed in accordance with *ODOT's 2020 LRFD Bridge Design Manual* (BDM) (ODOT, 2020), specifically utilizing the methodology presented in Section 802.1.2. Input information for our analyses was based on the soil characteristics gathered during NEAS's geotechnical exploration (i.e., SPT results, laboratory test results, etc.).

Based on our evaluation of the subsurface conditions and our geotechnical engineering analyses of the proposed reconstruction and widening project, it is our opinion that subgrade conditions are generally satisfactory, and pavement can be supported by the underlying subsurface material utilizing 12-inches of chemical stabilization (global stabilization) per ODOT's GB1, though certain segments of mainline IR-77, at which unsuitable soils were encountered, may require additional stabilization beyond the recommended 12-inches. Further detail regarding our subgrade analysis and the recommended remediation are provided in Section 5.1 and Section 5.2 of this report, respectively.

Noise wall drilled shaft foundation analysis and recommendations are provided in Section 5.5 of this report.

5.1. Subgrade Analysis

A GB1 analysis was performed to identify the method, location, and dimensions (including depth) of required subgrade stabilization for the project. In addition to identifying stabilization recommendations, pavement design parameters are also determined to aid in pavement section design. The subsections below present the results of our GB1 analysis including pavement design parameters and unsuitable subgrade conditions identified within the project limits. GB1 analysis spreadsheets are provided in Appendix F.

Again, it should be noted that for the purposes of this report and our analysis, the term 'proposed subgrade' has been assumed to represent soils and/or soil conditions from 1.5 ft below proposed final pavement grades to a depth of 7.5 ft below the proposed pavement grades.

5.1.1. Pavement Design Recommendations

It is our understanding that pavement analysis and design is to be performed to determine the proposed pavement sections for the segments within the project limits to undergo full depth replacement. A GB1 analysis was performed using the subgrade soil data obtained during our field exploration program to evaluate the soil characteristics and develop pavement parameters for use in pavement design. The subgrade parameters recommended for use in pavement design are presented in Table 6 below. Provided in the table are ranges of maximum, minimum and average N_{60L} values for the indicated segments as well as the design CBR value recommended for use in pavement design.

Table 6: Pavement Design Values

Segment	Maximum N_{60L}	Minimum N_{60L}	Average N_{60L}	Average PI Values	Design CBR
IR-77 NB & SB	30	3	13	11	7
IR-77 NB & SB - Existing Subgrade	30	5	15	10	8
IR-77 NB & SB - Widened Areas	30	3	11	12	7
Ramp A & B	22	10	14	12	7
Ramp C & D	11	5	9	15	7
Ramp L	18	8	13	10	7
Ramp M & N	18	10	15	11	9
Ramp R	22	7	13	8	10
Ramp S	15	5	12	9	8
Entire Project	**30**	**3**	**13**	**11**	**8**

5.1.2. Unsuitable Subgrade

Per ODOT's GB1, the presence of select subgrade conditions (i.e., unsuitable) are prohibited within the subgrade zone for new pavement construction. These unsuitable subgrade conditions generally include the presence of rock and specific soil types. With respect to the proposed pavement construction and realignment project these subgrade conditions are further discussed in the following subsections.

5.1.2.1. Rock

Rock was encountered within the subgrade in one (1) boring performed (B-042-0-20) within the project roadway limits. The bedrock was encountered at a depth of 3.0 ft bgs (elevation 1101.1 ft amsl) in boring B-042-0-20. Per ODOT's GB1, if rock is encountered within 24 inches of the bottom of the proposed asphalt or concrete pavement it is to be removed in accordance with 204.05 of the ODOT CMS and replaced with Item 204 Embankment. Therefore, based on the one boring where rock was encountered, no rock remediation is required at the site. It should be noted however, that rock remediation may be required if rock is encountered within 24 inches of the bottom of the proposed asphalt or concrete pavement during construction.

5.1.2.2. Unsuitable Soils

Unsuitable soil types per the GB1, which include A-4b, A-2-5, A-5, A-7-5, A-8a, A-8b, and soils with liquid limits greater than 65, were encountered within the subgrade of the referenced project roadway segments. Soil Type A-4b (Silt) was encountered within four (4) borings performed along the project portion of IR-77. A summary of the prohibited soils encountered and the associated GB1 recommended remediation depths are shown in Tables 7 below.

Table 7: Prohibited Soils Location Summary

Boring ID	Prohibited Soil Type	Depth Below Subgrade (ft)	Remediation Depth (inches)	
			Excavate and Replace (Item 204 w/ Geotextile)	Chemical Stabilization (Item 206)
Ramp/Roadway Segment: IR-77				
B-013-0-20	A-4b	1.0 - 5.5	36	14
B-025-0-20	A-4b	0.0 - 3.0	36	14
B-026-0-20	A-4b	0.5 - 2.5	30	14
B-027-0-20	A-4b	1.5 - 3.0	36	14

5.1.3. Unstable Soils

The GB1 recommends subgrade stabilization for soils considered unstable in which the N_{60} value of a particular soil sample (SS) at a referenced boring location is less than 12 bpf and in some cases less than 15 bpf (i.e., where moisture content is greater than optimum plus 3 percent). Based on the specific N_{60} value at the subject boring, *Figure B - Subgrade Stabilization* within the GB1 recommends a depth of subgrade stabilization for ODOT standard stabilization methods. It should be noted that although a soil sample's N_{60} value may meet the criteria to be considered an unstable soil, the depth in which the unstable soil is encountered in relation to the proposed subgrade is considered when each individual subgrade boring is analyzed. For example, if the GB1 recommends an excavate and replace of 12 inches within a weak soil underlying 18 inches of stable material, it would be unreasonable to recommend the removal of both the stable and unstable material for a total of 30 inches of excavate and replace.

Based on N_{60} values encountered within the project borings, our GB1 analysis suggests the need for 12 to 14 inches of chemical treatment or 12 to 15 inches excavate and replace at select locations. A summary of the boring locations where unstable soils were encountered and determined to have a potential impact on subgrade performance are shown in Table 8 below, per the roadway segment for which they were encountered. Also included is the associated GB1 recommended remediation depth at that location.

Table 8: Unstable Soil Locations Summary

Boring ID	Average HP (tsf)	N_{60}	Moisture Above Optimum (%)	Depth Below Subgrade (ft)	Remediation Depth (inches)		
					Excavate and Replace (Item 204 w/ Geotextile)	Excavate and Replace (Item 204 w/ Geogrid - SS 861)	Chemical Stabilization (Item 206)
Roadway Segment: IR-77							
B-011-0-20	1.75	-	4	0.0 - 1.5	12	-	12
B-022-0-20	-	10	-	0.0 - 1.0	12	-	14
B-025-0-20	-	14	7	0.0 - 3.0	12	-	12
B-026-0-20	-	11	-	0.0 - 0.5	12	-	12
B-028-0-20	-	11	3	0.0 - 1.5	12	-	12
B-032-0-20	-	5	-	0.0 - 0.8	12	-	12
B-035-0-20	-	10	-	0.0 - 0.4	12	-	12
B-036-0-20	-	10	3	0.0 - 0.9	12	-	12
B-037-0-20	-	14	4	0.0 - 1.5	12	-	12
B-038-0-20	-	10	-	0.0 - 0.8	12	-	12
B-039-0-20	-	11	-	0.0 - 0.8	12	-	12
B-044-0-20	-	7	-	0.0 - 3.9	15	-	14
B-046-0-20	-	11	3	0.0 - 1.5	12	-	12
B-053-0-20	-	7	-	0.0 - 1.5	15	-	14
B-054-0-20	-	8	-	0.0 - 0.7	12	-	12
B-055-0-20	1.5	10	3	0.0 - 0.1	12	-	12
B-058-0-20	-	11	-	0.0 - 1.5	12	-	12
B-061-0-20	2	8	-	0.0 - 4.0	12	-	14
B-063-0-20	-	11	3	0.0 - 1.2	12	-	12
Roadway Segment: Ramp L							
B-073-0-20	-	14	3	0.0 - 2.5	12	-	12
Roadway Segment: Ramps P & R							
B-071-0-20	-	8	7	0.0 - 1.5	12	-	14
Roadway Segment: Ramp S							
B-067-0-20	-	14	4	0.0 - 1.5	12	-	12

It should be noted that *Figure B - Subgrade Stabilization* does not apply to soil types A-1-a, A-1-b, A-3, or A-3a, nor to soils with N_{60L} values of 15 or more. Per GB1 guidance, *these soils should be reworked to stabilize the subgrade.*

5.1.3.1. High Moisture Content Soils

High moisture content soils are defined by the GB1 as soils that exceed the estimated optimum moisture content (per *Figure A - Optimum Moisture Content* within the GB1) for a given classification by 3 percent or more. Per the GB1, soils determined to be above the identified moisture content levels are a likely indication of the presence of an unstable subgrade and may require some form of subgrade stabilization. Similar to our analysis of unstable soils, although a soil sample's moisture content may meet the criteria to be considered high, the depth in which the high moisture soil is encountered in relation to the proposed subgrade is considered when each individual subgrade boring is analyzed for stabilization recommendations. Summaries of the boring locations where high moisture content conditions were encountered in the top 3 ft of subgrade within the limits of each proposed roadway segment are shown in Table 9 below.

Table 9: High Moisture Content Soils Location Summary

Boring ID	Moisture Content (%)	Optimum Moisture Content (%)	Depth Below Subgrade (ft)	Boring ID	Moisture Content (%)	Optimum Moisture Content (%)	Depth Below Subgrade (ft)
Roadway Segment: IR-77				**Roadway Segment: Ramp B**			
B-001-0-20	18	15	1.2 - 3.0	B-090-0-20	13	10	1.5 - 3.0
B-006-0-20	17	10	1.1 - 2.6	B-091-0-20	17	10	1.5 - 3.0
B-008-0-20	16	10	1.5 - 3.0	**Roadway Segment: Ramp C**			
B-009-0-20	16	12	1.5 - 3.0	B-084-0-20	17	14	0.0 - 1.5
B-017-0-20	12	8	0.0 - 1.0	**Roadway Segment: Ramp D**			
B-021-0-20	17	12	1.5 - 3.0	B-086-0-20	13	10	1.5 - 3.0
B-023-0-20	20	14	0.0 - 1.5	**Roadway Segment: Ramp L**			
B-026-0-20	26	14	0.5 - 2.5	B-075-0-20	25	12	0.0 - 1.5
B-027-0-20	25	11	1.5 - 3.0	B-078-0-20	19	15	0.5 - 2.0
B-031-0-20	14 & 21	10 & 12	0.0 - 3.0	**Roadway Segment: Ramp M**			
B-034-0-20	13	10	1.5 - 3.0	B-079-0-20	19	14	1.5 - 3.0
B-043-0-20	16	10	1.5 - 3.0	**Roadway Segment: Ramp P**			
B-047-0-20	13	10	0.8 - 2.3	B-070-0-20	18	14	1.5 - 3.0
B-053-0-20	19	16	1.5 - 3.0	**Roadway Segment: Ramp S**			
B-059-0-20	14	10	1.5 - 3.0	B-064-0-20	15 & 14	11	0.0 - 3.0
				B-066-0-20	15 & 19	10 & 14	0.0 - 3.0

5.2. Stabilization Recommendations

5.2.1. Subgrade Stabilization

Based on the results of our analysis, subgrade soils designated by ODOT's GB1 as both "unsuitable" and "unstable" were present at various locations throughout the project. Subgrade soils designated as "unsuitable" consisted of soils classifying as A-4b (Silt) and were encountered within subgrade depths that require remediation in four (4) borings (B-013-0-20 and B-025-0-20 through B-027-0-20) performed along IR-77. Subgrade soils designated as "unstable" were encountered at the various locations identified in Section 5.1.3 of this report. Although these materials were encountered throughout the site, guidance from ODOT's GB1 states that *"For all Interstates and other divided highways with four or more lanes more than 1-mile in project length, the subgrade of the entire project shall be chemically stabilized (global stabilization)*, except where *it is determined that soil is present where a majority of sulfate content values are found to be greater than 3,000 parts per million (ppm), or individual soil samples with sulfate contents greater than 5,000 ppm are present"* and therefore global chemical stabilization is recommended for the proposed interstate interchange improvement project except where otherwise indicated in this report.

The global chemical stabilization of the referenced mainline and ramp subgrade soils included within this project, should be performed to a minimum depth of 12 inches utilizing cement as the stabilizing chemical.

The stabilization efforts should extend a minimum of 18-inches beyond the edge of the paved roadway, shoulder or median. The mix design should be conducted in accordance with ODOT's CMS Supplement 1120 (Mixture Design for Chemically Stabilized Soils). For design purposes it may be assumed that the cement addition will be 5% using the following formula.

$$\text{Cement: } C = 0.75 \times T \times 115 \times 0.05$$

Where:

C = amount of chemical in pounds / square yard and

T = thickness of the treatment zone in inches

A dry density of 115-pounds per cubic foot (pcf) is assumed.

For areas where "unsuitable" A-4b (Silt) soils were encountered, it is recommended that either Excavate and Replace with geotextile (Item 204) be performed to a depth of 36 inches below the proposed top of subgrade, or chemical stabilization be performed to a depth of 14 inches. Our recommended limits for the indicated project subgrade stabilization are provided in Table 10 below.

Table 10: Stabilization Recommendations

Start Station	End Station	Excavate and Replace w/ Item 204[(1)] (inches)	Chemical Stabilization (inches)	Unsuitable Subgrade Conditions	Borings Considered
Entire Project					
Begin Work	End Work	12	14	N/A	-
IR-77 Northbound Lanes					
626+50 (CL IR-77)	631+00 (CL IR-77)	30	14	A-4b (Silt)	B-013-0-20
IR-77 Northbound and Southbound Lanes					
662+00 (CL IR-77)	674+50 (CL IR-77)	36	14	A-4b (Silt)	B-025-0-20, B-026-0-20, B-027-0-20

Notes:
1. Excavate and Replace depths for areas where Chemical Stabilization is not feasible.

It should be noted that per ODOT's GB1, *typical chemical stabilization equipment cannot stabilize areas less than 8 ft in width.* If it is anticipated that the project will require multiple maintenance of traffic phases, it is recommended that the roadway work is coordinated with the maintenance of traffic schemes in such a way that an 8-ft minimum width for chemical stabilization exists. If areas of less than 8 ft in width are anticipated, subgrade soils may be excavated out, mixed with stabilization chemical, and compacted in place, though this method is not practical for large areas

5.3. Embankment Stability Analysis

At the time of this report, project required embankment fills, sliver fills, or fills required for roadway widening purposes have not been identified. Following the development of project proposed cross-sections and the determination of required fills, NEAS will review the provided information for embankment stability. This review will also include fills potentially placed near the identified project lowland/wetland located within the vicinity of borings B-092-0-20 through B-097-0-20.

5.3.1. Embankment Construction Recommendations

In areas where additional embankment material is proposed along existing slopes (i.e., side-hill sliver fills) that are steeper than 8H:1V but flatter than 4H:1V, it is recommended that the proposed embankment be benched into the existing slopes in accordance with Item 203.05 "Embankment Construction Methods" of

the ODOT CMS. For areas where additional embankment material is proposed along existing slopes that are steeper than 4H:1V, it is recommended that the proposed embankment be designed and constructed in accordance with ODOT's GB2. For sidehill fills planned on existing slopes steeper than 4H:1V, ODOT's GB2 recommends that *the embankment slopes be constructed utilizing special benching in order to blend the new embankment with the existing slope to prevent the development of a weak shear plane at the interface between the proposed fill and existing slope material* (ODOT [2], 2017). As proposed cross-sections are not available at this time, at this stage of the project a special benching scheme similar to that shown in Figures 1, 2 or 3, as appropriate, of the ODOT GB2 should be used in areas where special benching is recommended. The height and width dimensions of the special benching scheme shown in these figures should be arranged to minimize the required cut and fill quantities, though the height of a single bench shall not exceed 20 ft without a stability analysis and design per OSHA requirements. Additionally, it may be appropriate to adjust the bench slope shown from a 1H:1V to a 1.75H:1V slope if the existing slope is made up of primarily granular materials. The benched material should be replaced with compacted engineered fill per Item 203 of the ODOT CMS, while proper lift thicknesses and material density should be maintained in the proposed fill per Item 203.06 of the ODOT CMS. In situations where it is not practical to extend the final bench through the existing roadway due to maintenance of traffic concerns, a benching scheme similar to that shown in Figure 1a of the ODOT GB2 can be used in order to avoid impacting the existing roadway, guardrail or shoulder. This scheme results in the placement of a temporary over-steepened fill that can later be "shaved-off" to bring the slope to the final proposed grade.

5.4. Noise Wall Foundation Design

This section provides information required to complete the design of 30-inch diameter drilled shaft noise wall supports. The geotechnical information has been developed in accordance with the ODOT BDM, Section 802.1.2. ODOT design methodology requires that the N_{60} values of the granular soils be corrected using a factor to account for the depth of each test, and the results analyzed to determine a mean (average $N_{60}/N1_{60}$) or minimum ($N_{60L}/N1_{60L}$) depending on the trend of the data and the specific soil type (i.e., granular or cohesive). Using the broad distinction between cohesive and granular soils, the mean or minimum is then used (designated as the design $N1_{60}$ herein) together with the proposed wall geometry to determine the depth of shaft required at that boring location based on the design tables provided in the ODOT BDM. As several sampling intervals may have not aligned with those shown in the ODOT BDM, linear interpolation was used to acquire $N1_{60}$ correction factors for unlisted depths. This analysis is presented within Appendices G and H.

The ODOT shaft design method should be a two-step process if the design is to be optimized. This process is described below using boring B-073-0-20 as an example and a noise wall with post spacing of 12 ft and a height of 15 ft. Level ground and no cut or fill is assumed for the example as well.

The design $N1_{60}$ value for B-073-0-20 is 8, based on the lowest value as the values are dissimilar and do not increase with depth. Furthermore, the plasticity index is less than 7 where the $N1_{60}$ value of 8 occurs (see boring log in Appendix C); therefore, the material is considered granular. Consulting the ODOT BDM Figure 802.1.2-1 for the conditions of a barrier height of 15 ft, a post spacing of 12 ft, a design $N1_{60}$ of 8, and a level ground condition, the shaft length is 11 ft.

Reviewing Appendix H for a situation where the foundation depth is 11 ft shows that the soils along a shaft of this length would be predominantly cohesive and would have a design $N1_{60}$ value of 8. Tables indicating design $N1_{60}$ value for various design shafts depth (i.e., 6 ft, 8 ft, 10 ft, etc.) per boring are provided in Appendix H. Referring to Figure 802.1.2-2 due to the soil at 11 ft being cohesive in nature, considering of a barrier height of 15 ft, a post spacing of 12 ft, and a design $N1_{60}$ value of 8, and a level ground condition,

the shaft length should be increased to 13.5 ft. Subsequent iterations are performed until the design $N1_{60}$ value or predominant soil type is not altered further after a change in the shaft length is determined. The ultimate result of these iterations for the example case using Boring B-073-0-20 is a design $N1_{60}$ value of 8 with predominantly cohesive soils along the shaft, yielding a shaft length of 13.5 ft.

At the time of this report the proposed noise wall grades (i.e., top of shaft elevations) were not available for review. Furthermore, if significant amounts of cuts or fills of the soils along the noise wall alignments are anticipated, the foundation design should be reviewed, and our analysis be updated to reflect the actual soil profiles along the proposed wall alignment.

The conditions reflected at each boring in Appendices G and H were observed at those locations only and may not be indicative of conditions at intermediate points between borings. However, for purposes of design it is recommended that the supports be sized based on conditions at the nearest boring. In other terms, each boring may be considered representative of sub-surface conditions up to half the distance to the next nearest boring away for design purposes.

5.4.1. Drilled Shaft Depths

Utilizing the design methodology presented in Section 5.4 of this report and in accordance with Section 800 *"Noise Barriers"* of the ODOT BDM, the drilled shaft design depths for the project noise walls are to be determined by the GPD Group. These drilled shaft depth calculations will be provided to ODOT as part of a separate submission.

5.4.2. Drilled Shaft Construction Considerations

Due to the observed cave-in depth of the noise wall borings performed at the site, it is anticipated that the holes bored for shaft construction will generally remain stable without the need for casing at the majority of the shaft locations so long as shaft lengths are not towards the upper bound of allowable length per the noted cave-in depths below. It should be noted that boring B-074-0-20 was indicated to have cave-in at a depth of 4 ft. Furthermore, with the exception of borings B-075-0-20 and B-078-0-20, groundwater was encountered in each of the noise wall borings performed at depths between 14.0 and 19.2 ft bgs. Each of these factor could be an indication that cave-in may occur, especially when extending the shaft below groundwater depths. If shaft termination elevations are determined to be below the groundwater level encountered within the adjacent borings, consideration to the presence of groundwater should be made in the construction of the shaft.

5.5. Light Pole Foundations Recommendations

It is our understanding that a total of fifteen (15) new high mast light poles are proposed as part of the project. To aide in the evaluation of light pole foundation design, the boring logs located adjacent to proposed light pole locations were reviewed, and a generalized material profile was developed. Utilizing the generalized soil profile, engineering properties (i.e., shear strength and unit weight) including properties for lateral load analysis (i.e., LPILE analysis) for each soil strata were estimated based on their field (i.e., SPT N_{60} values, hand penetrometer values, etc.) and laboratory (i.e., Atterberg Limits, grain size, etc.) test results using correlations provided in published engineering manuals, research reports and guidance documents. The developed soil profile and estimated engineering soil properties for evaluation of proposed signal pole foundations (with sited correlation/reference material) are summarized within Table 11 below.

Table 11: Shear Strength and LPILE Parameters at Light Pole Locations

Shear Strength and LPILE Parameters							
Boring Number	**p-y model**	**Elevation (ft-amsl)**	**Effective Unit Weight[1] (pcf)**	**Friction Angle[2] (degrees)**	**Undrained Shear Strength[3] (psf)**	**Lateral Soil Modulus Parameter, k (pci)**	**Soil Strain Parameter, E_{50} (%)**
B-001-1-20	Sand (Reese)	1012.6 - 1005.6	135	40	-	650	-
	Stiff Clay w/o Water	1005.6 - 988.1	125	27	2,650	890	0.0054
	Sand (Reese)	988.1 - 986.1	120	27	-	13	-
B-002-1-20	Sand (Reese)	1010.4 - 1003.4	125	36	-	220	-
	Sand (Reese)	1003.4 - 998.4	122	35	-	180	-
	Sand (Reese)	998.4 - 995.9	120	28	-	22	-
	Sand (Reese)	995.9 - 988.4	125	34	-	140	-
	Stiff Clay with Water	988.4 - 983.9	67	26	2,300	770	0.0058
B-004-1-20	Sand (Reese)	1011.3 - 1001.8	120	31	-	60	-
	Stiff Clay w/o Water	1001.8 - 999.3	118	23	1,000	220	0.0095
	Stiff Clay w/o Water	999.3 - 997.8	118	22	1,000	220	0.0095
	Sand (Reese)	997.8 - 993.8	120	31	-	60	-
	Stiff Clay w/o Water	993.8 - 989.3	122	25	2,000	660	0.0062
	Sand (Reese)	989.3 - 984.8	128	37	-	150	-
B-006-1-20	Sand (Reese)	997.0 - 990.5	118	27	-	15	-
	Soft Clay	990.5 - 985.0	112	19	500	55	0.0155
	Stiff Clay with Water	985.0 - 977.5	118	25	2,375	790	0.0057
	Sand (Reese)	977.5 - 975.0	66	35	-	100	-
	Sand (Reese)	975.0 - 970.5	68	39	-	205	-
B-008-1-20	Stiff Clay w/o Water	1006.1 - 996.6	122	25	1,950	650	0.0063
	Sand (Reese)	996.6 - 994.1	128	38	-	350	-
	Sand (Reese)	994.1 - 991.6	118	27	-	15	-
	Soft Clay	991.6 - 989.1	115	21	625	85	0.0132
	Sand (Reese)	989.1 - 984.1	128	38	-	350	-
	Sand (Reese)	984.1 - 979.6	125	32	-	85	-
B-009-1-20	Sand (Reese)	997.5 - 988.0	122	35	-	180	-
	Stiff Clay w/o Water	988.0 - 985.5	125	27	2,500	830	0.0056
	Stiff Clay w/o Water	985.5 - 981.5	122	25	1,800	600	0.0066
	Sand (Reese)	981.5 - 971.0	67	30	-	35	-
B-011-1-20	Stiff Clay w/o Water	1003.4 - 998.9	122	24	1,875	625	0.0065
	Sand (Reese)	998.9 - 993.9	122	33	-	105	-
	Stiff Clay w/o Water	993.9 - 991.4	120	23	1,250	350	0.0082
	Sand (Reese)	991.4 - 986.4	128	38	-	350	-
	Sand (Reese)	986.4 - 976.9	60	31	-	45	-
B-013-1-20	Stiff Clay w/o Water	997.5 - 993.0	122	25	1,750	580	0.0067
	Sand (Reese)	993.0 - 990.5	132	42	-	800	-
	Stiff Clay w/o Water	990.5 - 980.5	120	23	1,350	400	0.0079
	Sand (Reese)	980.5 - 978.0	122	30	-	45	-
	Stiff Clay with Water	978.0 - 971.0	118	23	960	200	0.0098
B-014-1-20	Stiff Clay w/o Water	996.3 - 981.3	120	23	1,475	480	0.0074
	Sand (Reese)	981.3 - 974.3	125	36	-	225	-
	Sand (Reese)	974.3 - 969.8	125	34	-	140	-
B-016-1-20	Sand (Reese)	979.3 - 969.8	120	33	-	105	-
	Stiff Clay w/o Water	969.8 - 967.3	122	26	2,250	750	0.0059
	Sand (Reese)	967.3 - 957.3	122	32	-	80	-
	Stiff Clay with Water	957.3 - 952.8	120	24	1,685	560	0.0069

Notes:

1. *Values interpreted from Geotechnical Bulletin 7 Table 1.*
2. *Values calculated from Terzaghi and Peck (1967) if $N1_{60}$<52, else Stroud and Butler (1975) was used.*
3. *Values interpreted from Geotechnical Bulletin 7 Table 2.*

Table 11 Continued: Shear Strength and LPILE Parameters at Light Pole Locations

Shear Strength and LPILE Parameters							
Boring Number	**p-y model**	**Elevation (ft-amsl)**	**Effective Unit Weight[1] (pcf)**	**Friction Angle[2] (degrees)**	**Undrained Shear Strength[3] (psf)**	**Lateral Soil Modulus Parameter, k (pci)**	**Soil Strain Parameter, E_{50} (%)**
B-019-1-20	Stiff Clay w/o Water	966.6 - 962.1	122	25	2,000	665	0.0062
	Sand (Reese)	962.1 - 940.1	120	33	-	110	-
B-022-1-20	Stiff Clay w/o Water	954.4 - 939.9	120	24	1,650	550	0.0069
	Stiff Clay w/o Water	939.9 - 934.9	120	24	1,500	500	0.0073
	Stiff Clay w/o Water	934.9 - 932.4	120	22	1,250	350	0.0082
	Sand (Reese)	932.4 - 927.9	122	32	-	85	-
B-023-1-20	Sand (Reese)	946.2 - 941.7	128	38	-	350	-
	Stiff Clay w/o Water	941.7 - 924.2	122	24	1,750	580	0.0067
	Sand (Reese)	924.2 - 919.7	125	32	-	85	-
B-070-1-20	Sand (Reese)	1007.0 - 1000.0	120	31	-	60	-
	Sand (Reese)	1000.0 - 997.0	122	33	-	110	-
	Sand (Reese)	997.0 - 980.5	125	36	-	225	-
B-071-1-20	Sand (Reese)	1000.1 - 993.1	122	32	-	80	-
	Sand (Reese)	993.1 - 988.1	122	33	-	105	-
	Sand (Reese)	988.1 - 973.6	122	34	-	140	-

Notes:

1. *Values interpreted from Geotechnical Bulletin 7 Table 1.*
2. *Values calculated from Terzaghi and Peck (1967) if $N1_{60}$<52, else Stroud and Butler (1975) was used.*
3. *Values interpreted from Geotechnical Bulletin 7 Table 2.*

6. QUALIFICATIONS

This investigation was performed in accordance with accepted geotechnical engineering practice for the purpose of characterizing the subsurface conditions along the referenced portions of roadways. This report has been prepared for GPD, ODOT and their design consultants to be used solely in evaluating the roadway embankment and subgrade soils within the project limits and presenting geotechnical engineering recommendations specific to this project. The assessment of general site environmental conditions or the presence of pollutants in the soil, rock and groundwater of the site was beyond the scope of this geotechnical exploration. Our recommendations are based on the results of our field explorations, laboratory tests results from representative soil samples, and geotechnical engineering analyses. The results of the field explorations and laboratory tests, which form the basis of our recommendations, are presented in the appendices as noted. This report does not reflect any variations that may occur between the borings or elsewhere on the site, or variations whose nature and extent may not become evident until a later stage of construction. In the event that any changes occur in the nature, design or location of the proposed interstate improvement work, the conclusions and recommendations contained in this report should not be considered valid until they are reviewed, and have been modified or verified in writing by a geotechnical engineer.

It has been a pleasure to be of service to GPD Group in performing this geotechnical exploration for the SUM-77- 24.12 Ghent Rd interstate improvement project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

Brendan P. Andrews, P.E.
Project Geotechnical Engineer

Kevin C. Arens, P.E.
Geotechnical Engineer

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APPENDIX A

ODNR OIL AND GAS WELL REPORTS

WELL SUMMARY

ODNR DIVISION OF OIL & GAS RESOURCES MANAGEMENT

API Well Number	34153220510000									Permit Issued	1/6/2004	
Well Name	LASALLE UNIT			Acres	28.7722	Well No.	1			Date Commenced	6/25/1985	
Owner	DIVERSIFIED PRODUCTION LLC					Well No.	3352001			Date Completed	7/2/1985	
Logging Co.	Eastern		Core No.		Sample No.							
County	SUMMIT	Township	BATH		Quadrangle	WEST RICHFIELD				Zone	N	
Section		Lot 46	Tract		Twp. Qtr.	Surface X	2240250	Y	549980	Bottom X	Y	NAD27
						Surface Lon	-81.627306	Lat	41.172983	Bottom Lon	Lat	NAD27
Measured	895' NL & 153' EL OF LOT 46					Surface X	2208786	Y	550010	Bottom X	Y	NAD83 SPS
						Prop TD	3709	Class	POOL	Tool	SERV	
GL	1030	DF	KB	1035	LTD 3709	DTD	3709	PB Depth		Date PB		
TD Form.	QUEENSTON FORMATION				Prod. Form.	CLINTON GROUP				Status	Producing	
IP Natural	1 MCF & 1 BO			IP AT	10 MCF & 10 BO & 1 BW	Initial Rock Pressure				Date Abandoned		

Perforations PI: 3517-3586, # Shots: 32PI: 3496-3588, Csg: PROD, Cmmnt:

Stimulations SI: 0-0, Fmtn Cd: 357170, Type: H2O, Vol: 1500 Bbl, #Prop: 50000, Cmmnt: SI: 0-0, Type: N2, Vol: 190 Mscf, Cmmnt:

Casing Record SURF 8.625 0-465, Comment: PROD 4.5 0-3665, Comment:

Log Types

Formations

Formation	Top	Bottom	Source	Prod.	Non-Standard	Remarks
BIG LIME	1916	3376	Driller	No		
ORISKANY SANDSTONE	2130	2180	Driller	No		
PACKER SHELL	3450	3475	Driller	No		
CLINTON SAND	3496	3588	Driller	Yes		
MEDINA SAND	3588	3670	Driller	No		
QUEENSTON FORMATION	3670		Driller	No		

Annual Production

Year	Quarter	Source	Oil	Gas	Water	Remarks
1986	N\A	RBDMS	983	19502	180	
1987	N\A	RBDMS	448	15589	70	
1988	N\A	RBDMS	270	9249	45	
1989	N\A	RBDMS	277	7312	40	
1990	N\A	RBDMS	138	3183	30	
1991	N\A	RBDMS	215	5582	40	
1992	N\A	RBDMS	68	3241	35	
1993	N\A	RBDMS	151	4733	39	
1994	N\A	RBDMS	89	4122	117	
1995	N\A	RBDMS	182	4246	125	
1996	N\A	RBDMS	0	3857	25	
1997	N\A	RBDMS	162	4070	92	
1998	N\A	RBDMS	78	4963	54	
1999	N\A	RBDMS	117	2682	26	
2000	N\A	RBDMS	0	1536	21	
2001	N\A	RBDMS	104	361	6	
2002	N\A	RBDMS	9	0	0	
2002	N\A	RBDMS	9	0	0	
2002	N\A	RBDMS	0	0	0	
2003	N\A	RBDMS	0	0	0	

2004	N\A	RBDMS	0	0	0
2005	N\A	RBDMS	0	0	0
2006	N\A	RBDMS	0	0	0
2007	N\A	RBDMS	0	304	3
2008	N\A	RBDMS	0	770	0
2009	N\A	RBDMS	0	409	0
2010	N\A	RBDMS	0	289	0
2011	N\A	RBDMS	0	678	0
2012	N\A	RBDMS	0	692	0
2013	N\A	RBDMS	0	709	60
2014	N\A	RBDMS	120	629	0
2015	N\A	RBDMS	0	337	0
2016	N\A	RBDMS	0	246	0
2017	N\A	RBDMS	0	1	0
2018	N\A	RBDMS	0	0	0
2019	N\A	RBDMS	0	81	0

WELL SUMMARY

ODNR DIVISION OF OIL & GAS RESOURCES MANAGEMENT

API Well Number	34153226610000									Permit Issued	5/16/1990
Well Name	BILLMAN			Acres	20	Well No.	1			Date Commenced	8/28/1990
Owner	ST CROIX LTD					Well No.				Date Completed	9/3/1990
Logging Co.	Eastern		Core No.		Sample No.						
County	SUMMIT	Township	BATH		Quadrangle	WEST RICHFIELD				Zone	N
Section		Lot 75	Tract		Twp. Qtr.	Surface X	2239950	Y	543230	Bottom X	Y NAD27
						Surface Lon	-81.628641	Lat	41.154465	Bottom Lon	Lat NAD27
Measured	385'NL & 225'EL OF LOT 75					Surface X	2208486	Y	543260	Bottom X	Y NAD83 SPS
						Prop TD		Class	POOL	Tool	RTF
GL	930	DF	KB	935	LTD	3624	DTD	3631	PB Depth	Date PB	
TD Form.	QUEENSTON FORMATION				Prod. Form.	CLINTON GROUP			Status	Producing	
IP Natural			IP AT	20 MCF & 3 BO		Initial Rock Pressure			Date Abandoned		

Perforations PI: 3439-3469, # Shots: 35PI: 3405-3470, Csg: PROD, Cmmnt:

Stimulations SI: 0-0, Fmtn Cd: 357170, Type: H2O, Vol: 105175 Gal, #Prop: 56000, Cmmnt:

Casing Record SURF 8.625 0-433, Comment: PROD 4.5 0-3602, Comment:

Log Types

Formations

Formation	Top	Bottom	Source	Prod.	Non-Standard	Remarks
BIG LIME	1830	3300	Driller	No		
PACKER SHELL	3371	3401	Driller	No		
CLINTON SAND	3405	3470	Driller	Yes		
QUEENSTON FORMATION	3592		Driller	No		

Annual Production

Year	Quarter	Source	Oil	Gas	Water	Remarks
1990	N\A	RBDMS	993	2280	2136	
1991	N\A	RBDMS	1708	3923	1227	
1992	N\A	RBDMS	957	2516	297	
1993	N\A	RBDMS	400	3160	284	
1994	N\A	RBDMS	260	1399	218	
1995	N\A	RBDMS	116	723	157	
1996	N\A	RBDMS	304	3179	282	
1997	N\A	RBDMS	410	3035	254	
1998	N\A	RBDMS	231	664	306	
1999	N\A	RBDMS	110	501	422	
2000	N\A	RBDMS	160	515	346	
2001	N\A	RBDMS	149	708	330	
2002	N\A	RBDMS	86	756	327	
2003	N\A	RBDMS	112	468	462	
2004	N\A	RBDMS	90	468	253	
2005	N\A	RBDMS	109	492	158	
2006	N\A	RBDMS	68	455	188	
2007	N\A	RBDMS	114	424	276	
2008	N\A	RBDMS	99	407	130	
2009	N\A	RBDMS	56	344	85	
2010	N\A	RBDMS	0	323	0	
2011	N\A	RBDMS	21	336	45	

2012	N\A	RBDMS	17	353	162
2013	N\A	RBDMS	16	342	92
2014	N\A	RBDMS	10	247	101
2015	N\A	RBDMS	22	238	87
2016	N\A	RBDMS	0	0	0
2017	N\A	RBDMS	0	0	0
2018	N\A	RBDMS	0	0	0

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WELL SUMMARY

ODNR DIVISION OF OIL & GAS RESOURCES MANAGEMENT

API Well Number	34153227360000									Permit Issued		11/15/1991
Well Name	DITOMMASO			Acres	23	Well No.	1			Date Commenced		2/10/1992
Owner	TRANSCONTINENTAL OIL & GAS INC					Well No.				Date Completed		2/15/1992
Logging Co.	Renegade Services, Eastern		Core No.		Sample No.							
County	SUMMIT	Township	BATH		Quadrangle	WEST RICHFIELD					Zone	N
Section	Lot 54	Tract		Twp. Qtr.		Surface X	2240425	Y	546800	Bottom X	Y	NAD27
						Surface Lon	-81.626786	Lat	41.164250	Bottom Lon	Lat	NAD27
Measured	700'SL & 301'WL OF LOT 54					Surface X	2208961	Y	546830	Bottom X	Y	NAD83 SPS
						Prop TD		Class	POOL	Tool		RTAF
GL	985	DF	KB	990	LTD	4716	DTD	3717	PB Depth		Date PB	
TD Form.	QUEENSTON FORMATION				Prod. Form.	CLINTON GROUP			Status	Producing		
IP Natural			IP AT	50 MCF & 2 BO & 1 BW		Initial Rock Pressure			1100	Date Abandoned		
Perforations	PI: 3530-3574, # Shots: 25PI: 3506-3612, Csg: PROD, Cmmnt:											
Stimulations	SI: 0-0, Fmtn Cd: 357170, Type: ACID, Vol: 500 Gal, #Prop: 70000, MISIP: 1100, BHP: 1000, Cmmnt: SI: 0-0, Type: N2, Vol: 250 Mscf, MISIP: 1000, BHP: 1000SI: 0-0, Type: H2O, Vol: 2400 Bbl, MISIP: 1000, BHP: 1000, Cmmnt:											
Casing Record	SURF 8.625 0-403, Comment: PROD 4.5 0-3684, Comment:											
Log Types	Perforating Depth Control, Perforating											

Formations

Formation	Top	Bottom	Source	Prod.	Non-Standard	Remarks
BIG LIME	1912	3388	Driller	No		
PACKER SHELL	3458	3489	Driller	No		
CLINTON SAND	3506	3612	Driller	Yes		
QUEENSTON FORMATION	3678		Driller	No		

Annual Production

Year	Quarter	Source	Oil	Gas	Water	Remarks
1992	N\A	RBDMS	0	0	100	
1993	N\A	RBDMS	0	0	0	
1994	N\A	RBDMS	0	0	0	
1995	N\A	RBDMS	0	0	0	
1996	N\A	RBDMS	7380	26989	957	
1997	N\A	RBDMS	4839	36704	113	
1998	N\A	RBDMS	3439	29533	74	
1999	N\A	RBDMS	2287	23317	61	
2000	N\A	RBDMS	2464	14952	45	
2001	N\A	RBDMS	1809	14377	0	
2002	N\A	RBDMS	1465	13431	0	
2003	N\A	RBDMS	1396	11229	20	
2004	N\A	RBDMS	1246	10058	0	
2005	N\A	RBDMS	976	8338	0	
2006	N\A	RBDMS	938	6143	0	
2007	N\A	RBDMS	806	5424	40	
2008	N\A	RBDMS	1466	9707	105	
2009	N\A	RBDMS	1126	11656	51	
2010	N\A	RBDMS	1084	9389	61	
2011	N\A	RBDMS	833	8687	0	
2012	N\A	RBDMS	522	8765	0	
2013	N\A	RBDMS	361	7306	37	
2014	N\A	RBDMS	546	5917	52	

2015	N\A	RBDMS	381	5491	0
2016	N\A	RBDMS	361	5000	0
2017	N\A	RBDMS	348	4208	0
2018	N\A	RBDMS	428	3756	80
2019	N\A	RBDMS	325	3675	141

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WELL SUMMARY

ODNR DIVISION OF OIL & GAS RESOURCES MANAGEMENT

API Well Number	34153227880000											Permit Issued		3/31/1995	
Well Name	FARR			Acres	20	Well No.	1					Date Commenced		9/21/1995	
Owner	ST CROIX LTD					Well No.						Date Completed		9/28/1995	
Logging Co.	Eastern		Core No.		Sample No.										
County	SUMMIT	Township	BATH		Quadrangle	WEST RICHFIELD						Zone		N	
Section	Lot 67	Tract		Twp. Qtr.		Surface X	2240700	Y	544400	Bottom X	2240950	Y	544944	NAD27	
						Surface Lon	-81.625875	Lat	41.157656	Bottom Lon	-81.624947	Lat	41.159142	NAD27	
Measured	1664 NL & 562 WL OF LOT 67					Surface X	2209236	Y	544430	Bottom X	2209486	Y	544974	NAD83 SPS	
	Target: 1120' NL & 810' WL OF LOT 67					Prop TD	0	Class	POOL	Tool	RTAF				
GL	900	DF	KB	LTD	3670	DTD	3695	PB Depth		Date PB					
TD Form.	CABOT HEAD SHALE			Prod. Form.	CLINTON GROUP			Status	Producing						
IP Natural		IP AT	10 MCF & 5 BO		Initial Rock Pressure			Date Abandoned							

Perforations PI: 3535-3585, # Shots: 40PI: 3517-3595, Csg: PROD, Cmmnt:

Stimulations SI: 0-0, Fmtn Cd: 357170, Type: H2O, Vol: 121000 Gal, #Prop: 62500, Cmmnt:

Casing Record SURF 8.625 0-342, Comment: PROD 4.5 0-3687, Comment:

Log Types

Formations

Formation	Top	Bottom	Source	Prod.	Non-Standard	Remarks
BIG LIME	1804	3390	Driller	No		
PACKER SHELL	3466	3500	Driller	No		
CLINTON SAND	3517	3595	Driller	Yes		
CABOT HEAD SHALE	3595		Driller	No		

Annual Production

Year	Quarter	Source	Oil	Gas	Water	Remarks
1997	N\A	RBDMS	627	4998	541	
1998	N\A	RBDMS	681	5716	140	
1999	N\A	RBDMS	706	5162	139	
2000	N\A	RBDMS	698	4887	379	
2001	N\A	RBDMS	664	3542	41	
2002	N\A	RBDMS	390	2299	47	
2003	N\A	RBDMS	405	1718	29	
2004	N\A	RBDMS	380	1817	62	
2005	N\A	RBDMS	293	1829	78	
2006	N\A	RBDMS	330	1763	110	
2007	N\A	RBDMS	346	1787	120	
2008	N\A	RBDMS	344	1574	160	
2009	N\A	RBDMS	334	1295	90	
2010	N\A	RBDMS	216	1516	196	
2011	N\A	RBDMS	276	1395	101	
2012	N\A	RBDMS	209	1498	95	
2013	N\A	RBDMS	202	1451	64	
2014	N\A	RBDMS	117	979	38	
2015	N\A	RBDMS	88	522	54	
2016	N\A	RBDMS	0	0	0	
2017	N\A	RBDMS	0	0	0	
2018	N\A	RBDMS	0	0	0	

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WELL SUMMARY

ODNR DIVISION OF OIL & GAS RESOURCES MANAGEMENT

API Well Number	34153228690000											Permit Issued		10/7/1997		
Well Name	FARR			Acres	21.26	Well No.	2					Date Commenced		12/19/1997		
Owner	ST CROIX LTD					Well No.						Date Completed		12/30/1997		
Logging Co.	Superior Well Services		Core No.		Sample No.											
County	SUMMIT	Township	BATH		Quadrangle	WEST RICHFIELD							Zone	N		
Section	Lot 67	Tract		Twp. Qtr.		Surface X	2241000	Y	544330	Bottom X	2240720	Y	545780	NAD27		
						Surface Lon	-81.624788	Lat	41.157455	Bottom Lon	-81.625752	Lat	41.161443	NAD27		
Measured	1825' NL & 668' WL OF LOT 67					Surface X	2209536	Y	544360	Bottom X	2209256	Y	545810	NAD83 SPS		
	Target: 302' NL & 413 ' WL OF LOT 67					Prop TD	0	Class	POOL	Tool	RTAF					
GL	940	DF	KB	LTD	4184	DTD	4215	PB Depth		Date PB						
TD Form.	QUEENSTON FORMATION			Prod. Form.	CLINTON GROUP			Status	Producing							
IP Natural		IP AT	10 MCF & 5 BO		Initial Rock Pressure			Date Abandoned								

Perforations	PI: 3940-4018, S/Ft: 53, # Shots: 53
Stimulations	SI: 3940-4018, Fmtn Cd: 357170, Stim In: CS, Type: H2O, Vol: 51503 Gal, #Prop: 68100, MBP: 1428, MTP: 1760, MISIP: 1473, 5SIP: 1297
Casing Record	SURF 8.625 0-377-0, Comment: , Sks: 150 PROD 4.5 0-4203, Comment: , Sks: 140
Log Types	Cased hole neutron, Casing collar locator/Gamma ray, Gamma Ray, Neutron

Formations

Formation	Top	Bottom	Source	Prod.	Non-Standard	Remarks
GLACIAL DEPOSITS	0	120	Driller	No		
BIG LIME	1821	3766	Log	No		
PACKER SHELL	3867	3896	Log	No		
CLINTON SAND	3914	3995	Log	Yes		
QUEENSTON FORMATION	4117		Log	No		

Annual Production

Year	Quarter	Source	Oil	Gas	Water	Remarks
1999	N\A	RBDMS	113	0	400	
2000	N\A	RBDMS	1716	3359	199	
2001	N\A	RBDMS	937	2750	186	
2002	N\A	RBDMS	449	1760	93	
2003	N\A	RBDMS	407	1738	29	
2004	N\A	RBDMS	428	1817	62	
2005	N\A	RBDMS	335	1540	131	
2006	N\A	RBDMS	300	1308	110	
2007	N\A	RBDMS	277	1312	76	
2008	N\A	RBDMS	290	1303	113	
2009	N\A	RBDMS	166	1213	48	
2010	N\A	RBDMS	165	1085	131	
2011	N\A	RBDMS	141	1139	67	
2012	N\A	RBDMS	200	1148	81	
2013	N\A	RBDMS	194	1112	55	
2014	N\A	RBDMS	112	860	32	
2015	N\A	RBDMS	83	687	38	
2016	N\A	RBDMS	0	0	0	
2017	N\A	RBDMS	0	0	0	
2018	N\A	RBDMS	0	0	0	

APPENDIX B

BORING LOCATION PLAN

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8 / 1	SUM-77-24.12	BORING LOCATION PLAN SUM-77-24.12 GHENT ROAD	DRAWN KCA CHECKED BPA	0 100 50 200 HORIZONTAL SCALE IN FEET

RAMP 10
B-071-0-20
RAMP R
RAMP P
B-072-0-20
B-071-1-20
B-068-0-20
B-014-0-20
P.C.-1
B-016-0-20
B-014-1-20
B-018-0-20
SUM-77 SOUTHBOUND
B-020-0-20
B-022-0-20
B-022-3-20
B-023-0-20
B-023-1-20
P.C.-4
B-016-1-20
B-019-1-20
B-021-0-20
B-022-1-20
GHENT ROAD
B-015-0-20
B-017-0-20
SUM-77 NORTHBOUND
B-022-2-20
B-013-0-20
RAMP 9
B-013-1-20
RAMP N
B-082-0-20
B-083-0-20
B-019-0-20
B-081-0-20
B-080-0-20
RAMP M
B-079-0-20
YELLOW CREEK ROAD
YELLOW CREEK
P.C.-3
P.C.-5
P.C.-2

LEGEND

BORING LOCATION

0 50 100 200
HORIZONTAL SCALE IN FEET

DRAWN KCA
CHECKED BPA

BORING LOCATION PLAN
SUM-77-24.12 GHENT ROAD

SUM-77-24.12

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8 3	SUM-77-24.12	**BORING LOCATION PLAN** **SUM-77-24.12 GHENT ROAD**	DRAWN KCA CHECKED BPA	0 100 50 200 HORIZONTAL SCALE IN FEET

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8 / 4	SUM-77-24.12	TARGET BORING PLAN SUM-77	DRAWN ZM CHECKED CH	0 100 50 200 HORIZONTAL SCALE IN FEET

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8 5	SUM-77-24.12	TARGET BORING PLAN SUM-77	DRAWN ZM CHECKED CH	0 100 50 200 HORIZONTAL SCALE IN FEET	N

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8	SUM-77-24.12	TARGET BORING PLAN SUM-77	DRAWN ZM CHECKED CH	0 100 50 200 HORIZONTAL SCALE IN FEET

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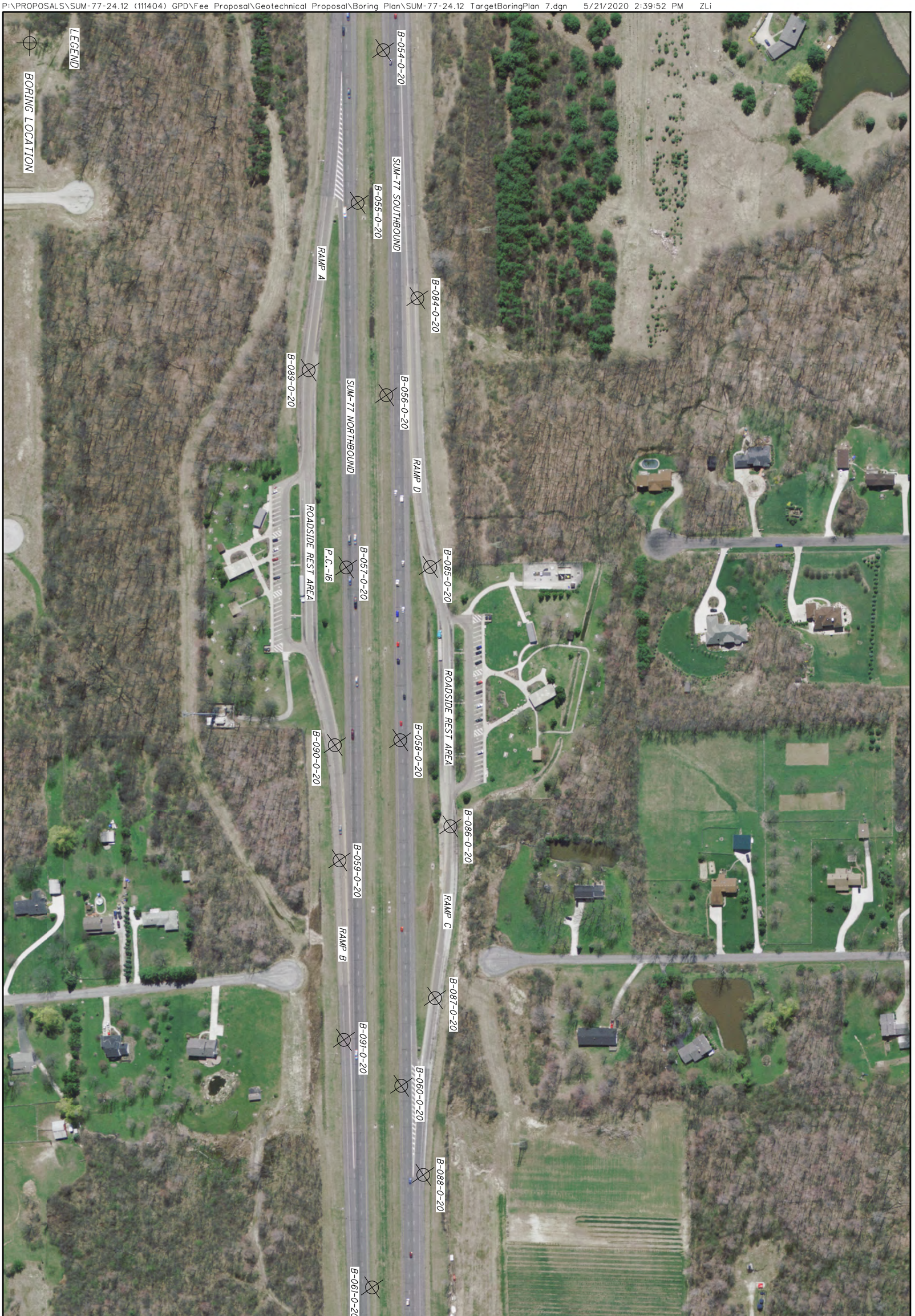

7 of 8	SUM-77-24.12	TARGET BORING PLAN SUM-77, RAMP A, B, C & D	DRAWN ZM CHECKED CH	0 100 50 200 HORIZONTAL SCALE IN FEET	N

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8 8	SUM-77-24.12	TARGET BORING PLAN SUM-77	DRAWN ZM CHECKED CH	0 100 50 200 HORIZONTAL SCALE IN FEET

APPENDIX C

BORING LOGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 300+01, 18' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1012.4 (MSL) EOB: 7.5 ft.
START: 8/25/20 END: 8/25/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.145999, -81.638665

EXPLORATION ID B-001-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1012.4	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
10.0" ASPHALT AND 8.0" BASE (DRILLERS DESCRIPTION)	1010.9	1																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP **(FILL)**	1009.7	2	6 8 6	19	100	SS-1A	-	35	20	23	16	6	NP	NP	NP	8	A-1-b (0)	<100	
						SS-1B	4.50	-	-	-	-	-	-	-	-	17	A-6a (V)	-	
VERY STIFF TO HARD, BROWNISH GRAY AND BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP		3	5 6 10	22	100	SS-2	3.75	1	1	3	54	41	33	20	13	18	A-6a (9)	-	
		4	4 7 10	23	67	SS-3	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		5																	
		6	4 6 12	25	56	SS-4	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
	1004.9	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / JL	DRILL RIG: CME 55T	STATION / OFFSET: 600+84, 1' LT.	EXPLORATION ID B-001-1-20
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / JL	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1012.6 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 9/23/21 END: 9/23/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 68.4	LAT / LONG: 41.146149, -81.638438	

MATERIAL DESCRIPTION AND NOTES	ELEV. 1012.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
8.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1011.4																	
VERY DENSE, ORANGISH BROWN BECOMING GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, SS-1 CONTAINS IRON STAINING, WET	1005.6	1																
		2																
		3	12 28 32	68	100	SS-1	-	0	1	68	28	3	NP	NP	NP	18	A-3a (0)	
		4																
		5	7 21 26	54	100	SS-2	-	-	-	-	-	-	-	-	-	18	A-3a (V)	
		6																
VERY STIFF TO HARD, GRAY, **SILT**, SOME TO "AND" CLAY, TRACE SAND, TRACE GRAVEL, MOIST TO WET		7																
		8	4 8 9	19	100	SS-3	4.50	0	0	1	64	35	25	19	6	21	A-4b (8)	
		9																
		10	6 7 9	18	100	SS-4	4.50	-	-	-	-	-	-	-	-	25	A-4b (V)	
		11																
		12																
		13	6 9 12	24	100	SS-5	4.50	0	0	3	51	46	25	16	9	21	A-4b (8)	
		14																
		15	3 7 11	21	100	SS-6	4.00	-	-	-	-	-	-	-	-	22	A-4b (V)	
		16																
		17																
		18	4 10 14	27	100	SS-7	4.25	-	-	-	-	-	-	-	-	21	A-4b (V)	
		19																
		20	5 8 13	24	100	SS-8	4.50	-	-	-	-	-	-	-	-	19	A-4b (V)	
		21																
		22																
		23	5 7 7	16	100	SS-9	4.50	-	-	-	-	-	-	-	-	20	A-4b (V)	
	988.1	24																
LOOSE, GRAY, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET		25																
	986.1	26	2 3 2	6	100	SS-10	-	0	0	6	81	13	NP	NP	NP	26	A-4b (8)	
		EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 403+91, 3' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1012.2 (MSL) EOB: 7.5 ft.
START: 11/24/20 END: 11/24/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.146716, -81.637602

EXPLORATION ID B-002-0-20

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
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, LITTLE SILT, TRACE CLAY, DAMP	1012.2	1																	
	1009.2	2	3 3 4	10	33	SS-1	-	-	-	-	-	-	-	-	-	10	A-3a (V)	<100	
VERY STIFF TO HARD, BROWN AND BROWNISH GRAY, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP		3	8 12 12	33	44	SS-2	4.50	6	9	15	47	23	30	19	11	15	A-6a (7)	-	
		4	8 8 8	22	39	SS-3	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
	1004.7	5	3 3 4	10	44	SS-4	2.25	5	8	8	43	36	34	21	13	18	A-6a (9)	-	
		6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 605+99, 3' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1010.4 (MSL) EOB: 26.5 ft.
START: 9/28/21 END: 9/28/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.146969, -81.636913

EXPLORATION ID B-002-1-20

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)	BACK FILL
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, CONTAINS TRACE BRICK AND ASPHALT FRAGMENTS, DAMP **(FILL)**	1010.4																	
		1																
		2																
		3	4 6 9	20	100	SS-1	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
		4																
		5	5 5 4	12	67	SS-2	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	
	1003.4	6																
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP		7																
		8	3 5 5	14	56	SS-3	-	18	39	21	14	8	NP	NP	NP	7	A-1-b (0)	
		9																
		10																
		11	4 5 6	15	56	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	998.4	12																
LOOSE, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, MOIST		13	4 2 3	7	39	SS-5	-	15	20	23	29	13	NP	NP	NP	15	A-4a (1)	
	995.9	14																
LOOSE TO MEDIUM DENSE, GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP		15																
		16	3 3 4	10	28	SS-6	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
		17																
		18	2 6 8	19	22	SS-7	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	
		19																
		20	3 6 13	26	39	SS-8	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	
	988.4	21																
HARD, GRAY, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, DAMP		22																
W 987.9		23	5 6 7	18	100	SS-9	4.50	1	12	15	47	25	22	17	5	16	A-4a (7)	
		24																
		25																
	983.9	26	6 7 7	19	100	SS-10	4.50	-	-	-	-	-	-	-	-	17	A-4a (V)	
EOB																		

NOTES: GROUNDWATER ENCOUNTERED AT 22.5' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 307+04, 16' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1007.0 (MSL) EOB: 7.5 ft.
START: 8/25/20 END: 8/25/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.147109, -81.636577

EXPLORATION ID B-003-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1007.0	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
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE GRAVEL, TRACE CLAY, DAMP @0.0' - 1.5'; CONTAINS TRACE ROOTS @1.5' - 4.5'; CONTAINS IRON STAINING			5 5 4	12	100	SS-1	-	15	30	28	21	6	NP	NP	NP	8	A-3a (0)	0	
			4 4 4	11	100	SS-2	-	-	-	-	-	-	-	-	-	10	A-3a (V)	-	
	1002.5	W 1002.5	3 2 3	7	100	SS-3	-	-	-	-	-	-	-	-	-	9	A-3a (V)	-	
SOFT TO STIFF, BROWN, **SILT**, SOME CLAY, SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST TO WET			1 2 3	7	50	SS-4	1.50	3	9	13	50	25	25	18	7	23	A-4b (8)	-	
	999.5	EOB	2 2 3	7	28	SS-5	0.50	-	-	-	-	-	-	-	-	29	A-4b (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 4.5' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 408+18, 9' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1016.3 (MSL) EOB: 7.5 ft.
START: 11/24/20 END: 11/24/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.147517, -81.636476

EXPLORATION ID B-004-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1016.3	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1014.8	1																	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY**, DAMP	1013.3	2	4 6 5	15	44	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-6 (V)	<100	
HARD, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1010.3	3 4 5	6 10 9	26	33	SS-2	4.25	17	21	24	25	13	24	15	9	11	A-4a (1)	-	
			6 8 9	23	39	SS-3	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
STIFF TO VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP	1008.8	6 7 EOB	2 4 3	10	28	SS-4	2.00	14	18	16	31	21	29	17	12	16	A-6a (4)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 610+13, 34' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1011.3 (MSL) EOB: 26.5 ft.
START: 9/28/21 END: 9/28/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.147693, -81.635749

EXPLORATION ID B-004-1-20

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)	BACK FILL
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE TO SOME GRAVEL, LITTLE SILT, TRACE CLAY, DAMP TO MOIST **(FILL)**	1011.3		4 3 2	7	100	SS-1	-	21	32	20	17	10	NP	NP	NP	10	A-3a (0)	
			3 2 2	5	33	SS-2	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
	1001.8		3 2 3	7	39	SS-3	-	-	-	-	-	-	-	-	-	11	A-3a (V)	
VERY STIFF, BROWN AND ORANGISH BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	999.3		3 3 3	8	89	SS-4	3.00	1	5	33	40	21	23	18	5	19	A-4a (5)	
STIFF, BROWN MOTTLED WITH ORANGISH BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET	997.8		4 3 3	8	100	SS-5A	1.75	1	0	8	41	50	33	21	12	30	A-6a (9)	
						SS-5B	-	-	-	-	-	-	-	-	-	24	A-3a (V)	
LOOSE, BROWN, **COARSE AND FINE SAND**, TRACE GRAVEL, TRACE SILT, TRACE CLAY, WET TO MOIST	993.8		2 2 4	8	44	SS-6	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
STIFF TO VERY STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP	989.3		2 3 4	10	50	SS-7	-	15	9	16	40	20	27	20	7	18	A-4a (5)	
			2 4 12	22	39	SS-8	-	-	-	-	-	-	-	-	-	17	A-4a (V)	
MEDIUM DENSE TO DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	984.8		3 5 10	20	44	SS-9	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	
	EOB		4 9 14	31	100	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 11/23/21 11:41 - X:\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\SUM-77-24.12 GHENT\GINT FILES\SUM-77-24.12.GPJ

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 310+99, 15' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1006.1 (MSL) EOB: 7.5 ft.
START: 8/25/20 END: 8/25/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.147730, -81.635402

EXPLORATION ID B-005-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1006.1	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
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS ROOTS, DAMP	1004.6	1	4 12 8	27	67	SS-1	-	37	18	16	19	10	NP	NP	NP	8	A-2-4 (0)	<100	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, DAMP	1001.6	2 3 4	5 6 6	16	67	SS-2	-	40	28	16	13	3	NP	NP	NP	8	A-1-b (0)	-	
			5 6 6	16	78	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	1000.1	5 6	3 3 3	8	67	SS-4	1.50	-	-	-	-	-	-	-	-	25	A-4a (V)	-	
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, MOIST	998.6	7 EOB	3 3 4	10	56	SS-5	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 411+96, 6' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1015.9 (MSL) EOB: 7.5 ft.
START: 8/26/20 END: 8/26/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148253, -81.635506

EXPLORATION ID B-006-0-20

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
HARD, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, CONTAINS ROOTS AND IRON STAINING, DAMP @1.5'; SS-2 BECOMES SOFT	1015.9	1	3 6 12	25	100	SS-1	4.50	18	15	20	31	16	28	20	8	11	A-4a (2)	<100	
		2	5 3 3	8	78	SS-2	0.25	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
VERY STIFF TO HARD, BROWN MOTTLED WITH GRAY AND ORANGISH BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST	1012.9	3	3 2 3	7	33	SS-3	4.25	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		4	5 5 5	14	100	SS-4	4.25	8	9	16	40	27	29	17	12	16	A-6a (7)	-	
		5	5 5 5	14	100	SS-5	2.75	-	-	-	-	-	-	-	-	21	A-6a (V)	-	
	1008.4	EOB 6 7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 614+20, 90' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 997.0 (MSL) EOB: 26.5 ft.
START: 9/28/21 END: 9/28/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148463, -81.634659

EXPLORATION ID B-006-1-20

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)	BACK FILL
VERY LOOSE, BLACK, **ORGANIC SILT**, SOME SAND, LITTLE CLAY, LITTLE GRAVEL, TRACE ROOTS, HIGH MOISTURE RESULTS DUE TO ORGANICS, DAMP @2.5' - 6.5'; 16.4% LOI (HIGHLY ORGANIC)	997.0		1 1 1	3	33	SS-1	-	11	18	12	41	18	NP	NP	NP	83	A-8a (V)	
	990.5		0 1 1	3	44	SS-2	-	-	-	-	-	-	-	-	-	100	A-8a (V)	
SOFT, GRAY, **CLAY**, "AND" SILT, TRACE SAND, TRACE GRAVEL, MOIST			0 1 2	4	100	SS-3	0.25	4	4	5	59	28	47	26	21	41	A-7-6 (14)	
	985.0		0 0 3	4	89	SS-4	0.25	-	-	-	-	-	-	-	-	29	A-7-6 (V)	
STIFF TO HARD, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP TO MOIST			3 3 6	12	100	SS-5	3.50	6	4	6	48	36	29	18	11	18	A-6a (8)	
			4 4 4	11	100	SS-6	4.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
	977.5	W 978.0	6 11 14	34	72	SS-7	1.75	-	-	-	-	-	-	-	-	22	A-6a (V)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, TRACE SILT, TRACE CLAY, WET	975.0		12 10 9	26	56	SS-8	-	-	-	-	-	-	-	-	-	23	A-3a (V)	
DENSE, BROWN AND GRAY, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, MOIST TO WET			12 12 13	34	100	SS-9	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	
	970.5	EOB	14 15 14	40	67	SS-10	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	

NOTES: GROUNDWATER ENCOUNTERED AT 19.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 315+00, 41' RT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1002.0 (MSL) EOB: 26.5 ft.
START: 10/13/20 END: 10/13/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.148240, -81.634096

EXPLORATION ID B-007-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1002.0	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
10.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1000.7	1																	
HARD, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP	999.0	2	4 6 7	18	56	SS-1	4.50	12	15	17	39	17	28	17	11	11	A-6a (5)	150	
HARD, BROWN AND GRAY, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, DAMP		3	5 6 6	16	67	SS-2	4.50	16	16	16	33	19	27	17	10	12	A-4a (3)	-	
		4	4 6 9	20	44	SS-3	4.25	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
	994.5	5	6 6 10	22	56	SS-4	4.25	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
STIFF TO HARD, BROWN WITH TRACE GRAY MOTTLES, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST		6																	
		7																	
		8																	
		9																	
		10	3 5 6	15	78	SS-5	4.50	2	5	10	48	35	30	19	11	18	A-6a (8)	-	
	985.0	11																	
	W 985.0	12																	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE TO SOME GRAVEL, TRACE SILT, TRACE CLAY, WET		13	6 5 6	15	72	SS-6	4.50	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
		14																	
		15	3 3 3	8	61	SS-7	1.75	-	-	-	-	-	-	-	-	20	A-6a (V)	-	
		16																	
		17																	
		18	3 2 3	7	83	SS-8	-	-	-	-	-	-	-	-	-	30	A-3a (V)	-	
		19																	
		20	5 7 13	27	56	SS-9	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
		21																	
		22																	
		23	7 7 12	26	72	SS-10	-	-	-	-	-	-	-	-	-	21	A-3a (V)	-	
	977.5	24																	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS**, LITTLE SAND, TRACE SILT, TRACE CLAY, WET		25																	
	975.5	26	8 8 13	29	89	SS-11	-	-	-	-	-	-	-	-	-	15	A-1-a (V)	-	
	EOB																		

NOTES: GROUNDWATER ENCOUNTERED AT 17.0' DURING DRILLING. HOLE CAVED-IN AT 20.5'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 1 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12
TYPE: SUBGRADE
PID: 111404 SFN:
START: 11/23/20 END: 11/23/20

DRILLING FIRM / OPERATOR: NEAS / J. HODGES
SAMPLING FIRM / LOGGER: NEAS / J. HODGES
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55X
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 12/5/19
ENERGY RATIO (%): 81.9

STATION / OFFSET: 415+88, 9' LT.
ALIGNMENT: IR-77 SB
ELEVATION: 1015.5 (MSL) EOB: 7.5 ft.
LAT / LONG: 41.149073, -81.634586

EXPLORATION ID B-008-0-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 1015.5	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
10.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1014.2																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, LITTLE SILT, TRACE CLAY, MOIST	1012.5	1	3 5 7	16	67	SS-1	-	21	35	16	20	8	NP	NP	NP	12	A-3a (0)	<100	
STIFF TO VERY STIFF, BROWN, **SANDY SILT**, LITTLE TO SOME CLAY, LITTLE GRAVEL, DAMP		2	3 3 3	8	44	SS-2	2.50	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
		3	4 6 5	15	39	SS-3	3.00	12	19	17	32	20	24	16	8	15	A-4a (3)	-	
	1008.0	4 EOB	4 6 7	18	33	SS-4	1.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 418+95, 120' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1006.1 (MSL) EOB: 26.5 ft.
START: 10/4/21 END: 10/4/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149883, -81.634034

EXPLORATION ID B-008-1-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1006.1	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
HARD, BROWN, **SANDY SILT**, LITTLE TO SOME GRAVEL AND STONE FRAGMENTS, LITTLE CLAY, SS-1 CONTAINS MANY ROOTS, DAMP TO MOIST			3 4 4	11	33	SS-1	4.50	-	-	-	-	-	-	-	-	20	A-4a (V)	
			2 4 4	11	100	SS-2	4.50	26	22	12	23	17	27	19	8	12	A-4a (1)	
	996.6		4 8 10	25	61	SS-3	4.25	-	-	-	-	-	-	-	-	20	A-4a (V)	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP	994.1		5 10 9	26	44	SS-4	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
LOOSE, GRAY, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, WET	991.6		3 2 2	5	39	SS-5	-	0	0	12	64	24	NP	NP	NP	22	A-4b (8)	
MEDIUM STIFF TO STIFF, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	989.1		2 2 2	5	50	SS-6	1.00	-	-	-	-	-	-	-	-	23	A-6a (V)	
MEDIUM DENSE TO DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	984.1		6 7 13	27	28	SS-7	-	32	31	12	16	9	NP	NP	NP	8	A-1-b (0)	
			7 9 14	31	44	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
MEDIUM DENSE, BROWN, **FINE SAND**, TRACE TO LITTLE COARSE SAND, TRACE TO LITTLE SILT, TRACE CLAY, TRACE GRAVEL, DAMP	979.6	EOB	5 6 7	18	56	SS-9	-	-	-	-	-	-	-	-	-	6	A-3 (V)	
			5 7 8	20	83	SS-10	-	-	-	-	-	-	-	-	-	8	A-3 (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12
TYPE: SUBGRADE
PID: 111404 SFN:
START: 8/8/20 END: 8/8/20

DRILLING FIRM / OPERATOR: NEAS / J. HODGES
SAMPLING FIRM / LOGGER: NEAS / J. HODGES
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55X
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 12/5/19
ENERGY RATIO (%): 81.9

STATION / OFFSET: 319+10, 1' LT.
ALIGNMENT: IR-77 NB
ELEVATION: 999.0 (MSL) EOB: 7.5 ft.
LAT / LONG: 41.148983, -81.632968

EXPLORATION ID B-009-0-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 999.0	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
12.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	997.7	1																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	996.0	2	8 6 5	15	44	SS-1	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	250	
SOFT TO VERY STIFF, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE TO LITTLE GRAVEL, DAMP TO MOIST		3	2 2 3	7	100	SS-2	0.50	10	21	22	32	15	26	17	9	16	A-4a (2)	-	
		4	2 4 6	14	44	SS-3	3.75	11	18	24	32	15	26	17	9	13	A-4a (2)	-	
		5																	
		6	4 3 4	10	56	SS-4	2.50	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
	991.5	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 619+33, 29' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 997.5 (MSL) EOB: 26.5 ft.
START: 9/28/21 END: 9/28/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149140, -81.633010

EXPLORATION ID B-009-1-20

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)	BACK FILL
LOOSE TO MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP	997.5																	
		1																
		2																
		3	5 4 4	11	39	SS-1	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	
		4																
		5	4 5 5	14	83	SS-2	-	33	36	19	9	3	NP	NP	NP	6	A-1-b (0)	
		6																
		7																
		8	2 3 2	7	78	SS-3	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
	988.0	9																
HARD, BROWN AND ORANGISH BROWN, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP		10																
		11	5 7 8	20	100	SS-4	4.50	1	2	9	63	25	30	21	9	19	A-4b (8)	
	985.5	12																
HARD, BROWN AND GRAY AND ORANGISH BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST		13	3 5 5	14	100	SS-5	4.50	-	-	-	-	-	-	-	-	19	A-4a (V)	
		14																
		15																
	981.5	16	4 5 6	15	100	SS-6A	4.50	-	-	-	-	-	-	-	-	24	A-4a (V)	
						SS-6B	-	-	-	-	-	-	-	-	-	12	A-3a (V)	
LOOSE TO MEDIUM DENSE, BROWN BECOMING GRAY, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET		W 980.0																
		17																
		18	3 2 3	7	100	SS-7	-	-	-	-	-	-	-	-	-	21	A-3a (V)	
		19																
		20																
		21	2 2 2	5	100	SS-8	-	0	1	78	18	3	NP	NP	NP	23	A-3a (0)	
		22																
		23	3 3 2	7	100	SS-9	-	-	-	-	-	-	-	-	-	25	A-3a (V)	
		24																
		25																
	971.0	26	3 4 3	10	100	SS-10	-	-	-	-	-	-	-	-	-	29	A-3a (V)	
		EOB																

NOTES: GROUNDWATER ENCOUNTERED AT 17.5' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 419+97, 15' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1008.2 (MSL) EOB: 7.5 ft.
START: 8/27/20 END: 8/27/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149781, -81.633434

EXPLORATION ID B-010-0-20

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
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, "AND" SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST	1008.2	1	6 8 9	23	67	SS-1	4.50	4	16	22	37	21	28	17	11	11	A-6a (5)	170	
		2	10 11 17	38	89	SS-2	4.50	1	18	39	25	17	28	15	13	13	A-6a (2)	-	
		3	9 7 9	22	100	SS-3	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		4	7 6 4	14	100	SS-4	4.25	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		5	3 4 4	11	100	SS-5	4.00	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	1000.7	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 323+93, 2' LT.	EXPLORATION ID B-011-0-20
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 995.0 (MSL) EOB: 7.5 ft.	PAGE 1 OF 1
START: 8/8/20 END: 8/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149754, -81.631542	

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
STIFF TO VERY STIFF, BROWN AND GRAY, **SANDY SILT**, LITTLE TO SOME CLAY, TRACE TO SOME GRAVEL, DAMP TO MOIST	995.0																		
@3.0' - 7.5'; CONTAINS IRON STAINING		1																	
		2	5 4 8	16	67	SS-1	1.75	5	14	20	38	23	25	16	9	15	A-4a (5)	133	
		3	3 4 5	12	44	SS-2	2.00	24	17	20	27	12	25	16	9	14	A-4a (1)	-	
		4																	
		5	3 3 2	7	89	SS-3	2.50	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
		6																	
	987.5	7 EOB	6 7 3	14	44	SS-4	2.50	-	-	-	-	-	-	-	-	16	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 625+08, 123' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1003.4 (MSL) EOB: 26.5 ft.
START: 9/29/21 END: 9/29/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150174, -81.631726

EXPLORATION ID: B-011-1-20

PAGE: 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1003.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP	998.9	1 2 3 4	5 6 5	15	83	SS-1	4.50	5	8	12	46	29	33	19	14	16	A-6a (10)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE TO LITTLE GRAVEL, TRACE TO LITTLE SILT, TRACE CLAY, DAMP	993.9	5 6 7 8 9	4 5 5	14	100	SS-2	-	-	-	-	-	-	-	-	-	13	A-3a (V)	
			1 3 5	11	22	SS-3	-	-	-	-	-	-	-	-	-	15	A-3a (V)	
STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS NO INTACT SOIL FOR HP READINGS, MOIST	991.4	10 11	2 3 4	10	33	SS-4	-	2	7	12	44	35	33	20	13	22	A-6a (9)	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE TO LITTLE SILT, TRACE CLAY, MOIST TO DAMP	986.4	12 13 14 15 16	2 8 11	26	44	SS-5	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	
			3 8 12	27	39	SS-6	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, WET	W 985.9	17 18 19 20 21 22 23 24 25 26	4 3 3	8	100	SS-7	-	4	17	62	13	4	NP	NP	NP	26	A-3a (0)	
			2 3 2	7	89	SS-8	-	-	-	-	-	-	-	-	-	26	A-3a (V)	
			3 3 4	10	100	SS-9	-	-	-	-	-	-	-	-	-	26	A-3a (V)	
	976.9	EOB	2 4 3	10	100	SS-10	-	-	-	-	-	-	-	-	-	26	A-3a (V)	

NOTES: GROUNDWATER ENCOUNTERED AT 17.5' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 424+12, 9' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1000.6 (MSL) EOB: 7.5 ft.
START: 11/23/20 END: 11/23/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150472, -81.632238

EXPLORATION ID B-012-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1000.6	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	999.1	1																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, MOIST		2	4 4 6	14	100	SS-1	-	23	38	16	17	6	NP	NP	NP	12	A-1-b (0)	<100	
		3	4 4 4	11	44	SS-2	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	-	
	994.6	4	4 3 5	11	33	SS-3	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	-	
MEDIUM DENSE, BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, DAMP	993.1	5	2 3 5	11	56	SS-4	-	42	12	12	21	13	24	16	8	13	A-2-4 (0)	-	
		6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 328+78, 16' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 988.5 (MSL) EOB: 7.5 ft.
START: 8/31/20 END: 8/31/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150647, -81.630244

EXPLORATION ID B-013-0-20

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
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	988.5																		
	987.0	1	4 5 6	15	78	SS-1	-	21	24	23	22	10	NP	NP	NP	11	A-2-4 (0)	110	
HARD, BROWN, **SILT**, "AND" CLAY, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST		2	5 9 14	31	100	SS-2	4.50	2	4	8	50	36	29	19	10	18	A-4b (8)	-	
		3	6 8 14	30	100	SS-3	4.50	-	-	-	-	-	-	-	-	18	A-4b (V)	-	
		4	4 6 7	18	100	SS-4	4.50	-	-	-	-	-	-	-	-	14	A-4b (V)	-	
		5																	
		6																	
	981.0	7	3 6 8	19	100	SS-5	4.50	-	-	-	-	-	-	-	-	23	A-4b (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 29+15, 74' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP N
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 997.5 (MSL) EOB: 26.5 ft.
START: 10/4/21 END: 10/4/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150450, -81.629714

EXPLORATION ID B-013-1-20

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)	BACK FILL
HARD, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL AND STONE FRAGMENTS, CONTAINS IRON STAINING, DAMP **(FILL)**	997.5																	
	993.0		4 5 5	14	100	SS-1	4.25	4	15	19	37	25	26	18	8	12	A-4a (5)	
VERY DENSE, BROWN AND GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, POSSIBLE COBBLE/BOULDER, DAMP **(FILL)**	990.5		50/3"	-	67	SS-2	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	
HARD, BROWNISH GRAY AND BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING AND ROOTS, SS-3 CONTAINS NO INTACT SOIL FOR HAND PEN READINGS, MOIST TO DAMP			5 4 4	11	22	SS-3	-	-	-	-	-	-	-	-	-	27	A-6a (V)	
			3 3 4	10	28	SS-4	4.25	-	-	-	-	-	-	-	-	20	A-6a (V)	
			4 5 4	12	100	SS-5	4.50	1	3	5	43	48	36	22	14	19	A-6a (10)	
	980.5		4 3 4	10	100	SS-6	4.25	-	-	-	-	-	-	-	-	23	A-6a (V)	
MEDIUM DENSE, BROWN, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET	978.0		3 4 4	11	33	SS-7	-	8	1	8	65	18	NP	NP	NP	20	A-4b (8)	
STIFF TO VERY STIFF, GRAY, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, MOIST			2 3 3	8	39	SS-8	3.00	0	0	2	64	34	24	16	8	19	A-4b (8)	
			3 3 2	7	89	SS-9	2.25	-	-	-	-	-	-	-	-	19	A-4b (V)	
	971.0	EOB	3 2 4	8	67	SS-10	2.00	-	-	-	-	-	-	-	-	19	A-4b (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 428+74, 41' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 988.8 (MSL) EOB: 7.5 ft.
START: 12/7/20 END: 12/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151315, -81.630975

EXPLORATION ID B-014-0-20

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
6.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	988.8																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP	987.8	1	10 12 7	26	67	SS-1	-	33	21	16	20	10	NP	NP	NP	10	A-2-4 (0)	<100	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP	985.8	2 3 4	4 9 11	27	100	SS-2	-	-	-	-	-	-	-	-	-	12	A-3a (V)	-	
VERY STIFF, BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, CONTAINS TRACE IRON STAINING, DAMP	984.3	5	4 5 5	14	67	SS-3	2.25	21	22	20	24	13	20	13	7	11	A-4a (0)	-	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS TRACE IRON STAINING, MOIST	982.8	6	3 6 8	19	89	SS-4	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	-	
	981.3 EOB	7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 429+22, 77' RT.	EXPLORATION ID B-014-1-20
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 996.3 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 9/29/21 END: 9/29/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151129, -81.630579	

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)	BACK FILL
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, MOIST TO DAMP	996.3																	
			2 3 4	10	100	SS-1	3.75	-	-	-	-	-	-	-	-	27	A-6a (V)	
			3 3 4	10	100	SS-2	4.50	1	3	5	50	41	33	21	12	20	A-6a (9)	
			3 4 5	12	100	SS-3	4.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
			4 5 6	15	100	SS-4	4.25	-	-	-	-	-	-	-	-	21	A-6a (V)	
			5 4 5	12	100	SS-5	4.50	-	-	-	-	-	-	-	-	19	A-6a (V)	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	981.3		3 5 7	16	39	SS-6	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			3 6 9	20	44	SS-7	-	30	28	20	15	7	NP	NP	NP	6	A-1-b (0)	
			3 7 12	26	44	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE GRAVEL, TRACE CLAY, DAMP	974.3		4 6 10	22	50	SS-9	-	13	23	40	19	5	NP	NP	NP	8	A-3a (0)	
			3 8 11	26	100	SS-10	-	-	-	-	-	-	-	-	-	4	A-3a (V)	
	969.8	EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 332+00, 16' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 982.8 (MSL) EOB: 7.5 ft.
START: 8/31/20 END: 8/31/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151300, -81.629462

EXPLORATION ID B-015-0-20

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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
LOOSE TO DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, DAMP	982.8	1	4 4 11	20	100	SS-1	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	<100	
		2	15 13 12	34	100	SS-2	-	40	30	14	13	3	NP	NP	NP	6	A-1-b (0)	-	
		3	3 6 9	20	100	SS-3	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	-	
		4	2 6 6	16	67	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	-	
		5	3 3 3	8	67	SS-5	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	-	
	975.3	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 432+37, 1' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 981.2 (MSL) EOB: 7.5 ft.
START: 11/23/20 END: 11/23/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151834, -81.629846

EXPLORATION ID B-016-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 981.2	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
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	976.7	1	5 5 7	16	89	SS-1	-	21	26	23	20	10	NP	NP	NP	10	A-2-4 (0)	<100	
		2																	
		3																	
		4	8 12 9	29	44	SS-2	-	-	-	-	-	-	NP	NP	NP	10	A-2-4 (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE GRAVEL, TRACE CLAY, DAMP	973.7	5	6 9 10	26	44	SS-3	-	-	-	-	-	-	-	-	-	9	A-3a (V)	-	
		6																	
	EOB	7	8 11 7	25	100	SS-4	-	-	-	-	-	-	-	-	-	12	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 635+12, 29' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 979.3 (MSL) EOB: 26.5 ft.
START: 9/29/21 END: 9/29/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151961, -81.629039

EXPLORATION ID B-016-1-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 979.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
LOOSE TO MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP		1																
		2																
		3	3 3 2	7	100	SS-1	-	23	30	24	17	6	24	17	7	10	A-2-4 (0)	
		4																
		5	3 2 2	5	100	SS-2	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	
		6																
		7																
		8	3 4 6	14	28	SS-3	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	
	969.8	9																
HARD, BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP		10																
		11	4 5 8	18	44	SS-4	4.50	22	10	16	36	16	27	18	9	13	A-4a (3)	
	967.3	12																
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, DAMP		13	4 5 4	12	33	SS-5	-	-	-	-	-	-	-	-	-	8	A-3a (V)	
		14																
		15	3 4 4	11	44	SS-6	-	-	-	-	-	-	-	-	-	5	A-3a (V)	
		16																
		17																
		18	4 4 4	11	28	SS-7	-	-	-	-	-	-	-	-	-	6	A-3a (V)	
		19																
		20																
		21	3 4 5	12	39	SS-8	-	-	-	-	-	-	-	-	-	5	A-3a (V)	
	957.3	22																
HARD, BROWN BECOMING GRAY, **SILT**, LITTLE CLAY, LITTLE SAND, TRACE GRAVEL, DAMP		23	4 5 6	15	50	SS-9	4.50	5	3	15	59	18	27	21	6	18	A-4b (8)	
		24																
		25																
		26	6 4 5	12	67	SS-10	4.25	-	-	-	-	-	-	-	-	16	A-4b (V)	
	952.8	EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 336+02, 13' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 972.9 (MSL) EOB: 7.5 ft.
START: 8/31/20 END: 8/31/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.152174, -81.628586

EXPLORATION ID B-017-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 972.9	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
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE CLAY, LITTLE GRAVEL, CONTAINS IRON STAINING, MOIST	971.4		2 3 5	11	100	SS-1	-	11	17	46	14	12	NP	NP	NP	12	A-3a (0)	<100	
VERY LOOSE TO MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY**, CONTAINS IRON STAINING, DAMP		1	6 6 4	14	100	SS-2	-	33	30	12	13	12	35	19	16	15	A-2-6 (1)	-	
		2	2 3 4	10	56	SS-3	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	-	
		3	1 1 2	4	67	SS-4	-	-	-	-	-	-	-	-	-	16	A-2-6 (V)	-	
		4	2 1 1	3	78	SS-5	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	-	
	965.4	5 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 436+21, 0' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 971.7 (MSL) EOB: 7.5 ft.
START: 11/23/20 END: 11/23/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.152589, -81.628873

EXPLORATION ID B-018-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 971.7	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	970.2	1																	
MEDIUM DENSE, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	967.2	2 3 4	12 6 6	16	100	SS-1	-	-	-	-	-	-	-	-	-	11	A-4a (V)	<100	
			4 10 11	29	44	SS-2	-	15	22	27	25	11	NP	NP	NP	8	A-4a (0)	-	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	964.5	5 6	5 8 9	23	56	SS-3	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	-	
			4 4 4	11	56	SS-4A	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	-	
HARD, BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP	964.2	EOB 7				SS-4B	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 340+31, 1' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 963.9 (MSL) EOB: 7.5 ft.
START: 8/8/20 END: 8/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.153167, -81.627751

EXPLORATION ID B-019-0-20

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
VERY STIFF, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, DAMP	963.9																		
	961.9	1	7 5 10	20	67	SS-1A	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	<100	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, LITTLE SILT, TRACE CLAY, DAMP	960.9	2				SS-1B	-	23	19	41	14	3	NP	NP	NP	9	A-3a (0)	-	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	959.9	3	5 11 9	27	100	SS-2A	-	30	24	29	13	4	NP	NP	NP	8	A-1-b (0)	-	
	959.4	4				SS-2B	1.00	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
MEDIUM STIFF TO STIFF, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, DAMP	957.9	5	5 5 6	15	44	SS-3	-	-	-	-	-	-	-	-	-	9	A-2-4 (V)	-	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	956.4	6	7 6 5	15	33	SS-4	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, LITTLE SILT, TRACE CLAY, MOIST	EOB	7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 640+38, 24' LT.	EXPLORATION ID B-019-1-20
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 966.6 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 9/29/21 END: 9/29/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.153169, -81.628018	

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)	BACK FILL
HARD, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, DAMP	966.6		2 6 6	16	100	SS-1	4.50	8	4	11	47	30	28	18	10	15	A-4a (8)	
	962.1																	
VERY LOOSE TO MEDIUM DENSE, BROWN BECOMING ORANGISH BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND**, TRACE TO LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, DAMP			2 2 2	5	100	SS-2	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
			2 3 2	7	39	SS-3	-	7	43	41	7	2	NP	NP	NP	7	A-1-b (0)	
			2 2 1	4	44	SS-4	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
			2 3 4	10	22	SS-5	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
			2 5 5	14	33	SS-6	-	35	35	15	12	3	NP	NP	NP	11	A-1-b (0)	
			3 2 2	5	28	SS-7	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	
			2 1 2	4	44	SS-8	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	
			3 4 6	14	33	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
	940.1	EOB	6 5 5	14	44	SS-10	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 440+21, 1' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 961.8 (MSL) EOB: 7.5 ft.
START: 11/23/20 END: 11/23/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.153475, -81.628021

EXPLORATION ID B-020-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 961.8	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
12.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	960.5																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP		1	6 10 11	29	100	SS-1	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	140	
	957.3	2	8 12 7	26	44	SS-2	-	25	21	23	24	7	NP	NP	NP	6	A-2-4 (0)	-	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE GRAVEL, TRACE SILT, TRACE CLAY, DAMP		3	6 7 7	19	56	SS-3	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
	954.3	4	6 3 4	10	100	SS-4	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
		EOB 7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 343+97, 3' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 955.0 (MSL) EOB: 7.5 ft.
START: 8/8/20 END: 8/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.154078, -81.627197

EXPLORATION ID B-021-0-20

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
11.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	955.0																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, TRACE SILT, TRACE CLAY, DAMP	953.1	1	8 8 6	19	44	SS-1	-	-	-	-	-	-	-	-	-	10	A-3a (V)	<100	
VERY STIFF, BROWN AND ORANGISH BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, CONTAINS IRON STAINING, DAMP	952.0	2																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, CONTAINS IRON STAINING, MOIST	950.5	3	7 5 8	18	56	SS-2	3.25	16	12	21	39	12	21	17	4	17	A-4a (3)	-	
VERY STIFF, BROWN AND ORANGISH BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, WET	949.0	4																	
	947.5	5	6 8 10	25	39	SS-3	-	-	-	-	-	-	-	-	-	13	A-3a (V)	-	
	EOB	6	4 6 4	14	67	SS-4	3.25	3	3	32	42	20	24	17	7	23	A-4a (5)	-	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 443+14, 12' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 954.4 (MSL) EOB: 7.5 ft.
START: 8/31/20 END: 8/31/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.154168, -81.627472

EXPLORATION ID B-022-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 954.4	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
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, DAMP	954.4	1	3 3 4	10	89	SS-1	3.00	14	17	22	30	17	27	17	10	12	A-4a (2)	120	
		2	7 8 10	25	100	SS-2	4.50	-	-	-	-	-	-	-	-	11	A-4a (V)	-	
		3	4 6 8	19	100	SS-3	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
	949.9	4																	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP		5	3 4 5	12	100	SS-4	4.50	6	10	17	37	30	31	17	14	14	A-6a (8)	-	
		6	3 5 6	15	100	SS-5	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
	946.9	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 645+87, 3' LT.	EXPLORATION ID B-022-1-20
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 954.4 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 9/30/21 END: 9/30/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.154514, -81.627136	

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)	BACK FILL
VERY STIFF TO HARD, BROWN BECOMING GRAY, **SANDY SILT**, LITTLE TO SOME CLAY, TRACE TO LITTLE GRAVEL, DAMP TO MOIST	954.4																	
			3 10 8	25	100	SS-1	4.50	7	13	24	39	17	22	15	7	11	A-4a (4)	
			3 2 3	7	100	SS-2	4.50	-	-	-	-	-	-	-	-	14	A-4a (V)	
			3 4 6	14	100	SS-3	4.50	-	-	-	-	-	-	-	-	16	A-4a (V)	
			2 4 5	12	56	SS-4	3.50	-	-	-	-	-	-	-	-	13	A-4a (V)	
	939.9		3 2 4	8	100	SS-5	2.75	-	-	-	-	-	-	-	-	19	A-4a (V)	
HARD, GRAY, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, DAMP	934.9		2 4 6	14	100	SS-6	4.50	5	8	8	53	26	29	19	10	19	A-4b (8)	
			3 3 4	10	22	SS-7	4.25	-	-	-	-	-	-	-	-	14	A-4b (V)	
HARD, BROWN, **CLAY**, SOME SILT, TRACE SAND, TRACE GRAVEL, DAMP	932.4		2 3 4	10	100	SS-8	4.50	1	1	1	25	72	48	24	24	24	A-7-6 (15)	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, DAMP TO MOIST	927.9		3 4 6	14	100	SS-9	-	-	-	-	-	-	-	-	-	9	A-3a (V)	
		EOB	2 4 6	14	89	SS-10	-	-	-	-	-	-	-	-	-	13	A-3a (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 644+65, 79' RT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 955.3 (MSL) EOB: 49.0 ft.
START: 1/31/22 END: 1/31/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.154117, -81.627021

EXPLORATION ID B-022-2-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 955.3	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
14.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	953.6																		
VERY STIFF, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	952.3	1	26 29 9	43	83	SS-1	2.50	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
LOOSE TO MEDIUM DENSE, BROWN BECOMING GRAY, **SILT**, SOME CLAY, LITTLE TO SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET TO MOIST		2																	
		3																	
		4	3 3 4	8	64	SS-2	-	1	3	8	66	22	NP	NP	NP	23	A-4b (8)	-	
		5																	
		6																	
		7																	
		8																	
		9	4 5 9	16	100	SS-3	-	-	-	-	-	-	-	-	-	15	A-4b (V)	-	
		10																	
		11																	
		12																	
		13																	
		14	4 5 6	12	94	SS-4	-	-	-	-	-	-	-	-	-	19	A-4b (V)	-	
		15																	
		16																	
		17																	
		18																	
		19	3 3 5	9	100	SS-5	-	-	-	-	-	-	-	-	-	19	A-4b (V)	-	
	934.8	20																	
VERY STIFF TO HARD, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, MOIST TO DAMP		21																	
		22	2 3 4	8	100	SS-6	3.25	0	1	1	48	50	34	21	13	23	A-6a (9)	-	
		23																	
		24	3 6 5	12	100	SS-7	4.25	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
		25																	
		26																	
		27	3 3 6	10	100	SS-8	4.25	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
	927.3	28																	
MEDIUM DENSE TO DENSE, GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP		29	7 13 16	33	33	SS-9	-	37	9	28	20	6	NP	NP	NP	9	A-2-4 (0)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 644+65, 79' RT.	START: 1/31/22	END: 1/31/22	PG 2 OF 2	B-022-2-20

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
MEDIUM DENSE TO DENSE, GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP *(continued)*	925.3																		
		31	8 13 17	34	100	SS-10	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	-	
		32																	
		33																	
		W 921.3 34	9 11 12	26	61	SS-11	-	36	15	16	26	7	NP	NP	NP	11	A-2-4 (0)	-	
	919.8	35																	
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, SS-13 CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP		36	7 11 13	27	100	SS-12	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	-	
		37																	
		38																	
		39	8 12 15	30	11	SS-13	-	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
	914.8	40																	
DENSE, GRAY, **SILT**, LITTLE SAND, LITTLE CLAY, TRACE GRAVEL, MOIST		41	10 13 16	33	97	SS-14	-	1	2	12	72	13	NP	NP	NP	16	A-4b (8)	-	
	912.3	42																	
HARD, GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		43																	
		44	6 7 10	19	100	SS-15	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
	909.8	45																	
MEDIUM DENSE, GRAY, **SANDY SILT**, TRACE CLAY, TRACE GRAVEL, DAMP		46	7 9 11	23	78	SS-16	-	0	0	51	39	10	NP	NP	NP	13	A-4a (3)	-	
	907.8	47																	
DENSE, GRAY, **SILT**, LITTLE SAND, LITTLE CLAY, TRACE GRAVEL, DAMP		48	12 14 18	36	89	SS-17	-	-	-	-	-	-	-	-	-	19	A-4b (V)	-	
	906.3	EOB 49																	

NOTES: GROUNDWATER ENCOUNTERED AT 34.0' DURING DRILLING. HOLE CAVE-IN AT 31.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 645+30, 80' LT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 951.2 (MSL) EOB: 48.0 ft.
START: 2/2/22 END: 2/2/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.154443, -81.627471

EXPLORATION ID B-022-3-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 951.2	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	949.7	1																	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP	948.2	2	30 (18 9)	30	89	SS-1	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	-	
LOOSE, BROWN, **SILT**, SOME SAND, SOME CLAY, TRACE GRAVEL, DAMP	944.4	3 4 5 6 7 8 9	4 (4 3)	8	67	SS-2	-	2	8	16	51	23	NP	NP	NP	14	A-4b (8)	-	
UNCONTROLLED FILL, 1.25" TILE	939.4	10 11 12 13 14	9 (16 10)	29	6	SS-3	-	-	-	-	-	-	-	-	-	-	UCF (V)	-	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP	934.4	15 16 17 18 19	9 (8 8)	18	83	SS-4	4.50	7	14	20	31	28	28	17	11	11	A-6a (5)	-	
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, SS-6 CONTAINS ROOTS AND IRON STAINING, DAMP TO MOIST	928.2	20 21 22 23	3 (4 4)	9	81	SS-5	4.25	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
			3 (2 4)	7	100	SS-6	3.00	-	-	-	-	-	-	-	-	21	A-4a (V)	-	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	925.7	24 25	8 (6 6)	14	78	SS-7	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	-	
VERY STIFF TO HARD, BROWN MOTTLED WITH GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST		26 27 28 29	2 (4 5)	10	64	SS-8	4.50	0	5	7	59	29	27	16	11	17	A-6a (8)	-	
			4 (3 5)	9	100	SS-9	3.50	-	-	-	-	-	-	-	-	19	A-6a (V)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 645+30, 80' LT.	START: 2/2/22	END: 2/2/22	PG 2 OF 2	B-022-3-20

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
VERY STIFF TO HARD, BROWN MOTTLED WITH GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST *(continued)*	921.2	31																	
		32	3 2 5	8	100	SS-10	4.50	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
	918.2	W 918.2 33																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, WET		34	3 5 8	15	100	SS-11	-	0	3	66	26	5	NP	NP	NP	21	A-3a (0)	-	
		35																	
		36	6 10 13	26	100	SS-12	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
	913.2	37																	
MEDIUM DENSE, GRAY, **SILT**, LITTLE SAND, TRACE TO LITTLE CLAY, TRACE GRAVEL, WET TO MOIST		38																	
		39	7 9 12	24	89	SS-13	-	0	0	14	76	10	NP	NP	NP	21	A-4b (8)	-	
		40																	
		41	6 9 10	21	86	SS-14	-	-	-	-	-	-	-	-	-	24	A-4b (V)	-	
		42																	
		43	6 7 9	18	83	SS-15	-	-	-	-	-	-	-	-	-	15	A-4b (V)	-	
		44																	
BECOMES DAMP		45																	
		46	8 11 15 17	29	75	SS-16	-	-	-	-	-	-	-	-	-	9	A-4b (V)	-	
	903.2	EOB 47 48																	

NOTES: GROUNDWATER ENCOUNTERED AT 33.0' DURING DRILLING. HOLE CAVE-IN AT 30.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 348+72, 6' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 949.5 (MSL) EOB: 7.5 ft.
START: 12/9/20 END: 12/9/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.155313, -81.626651

EXPLORATION ID B-023-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 949.5	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
15.0" ASPHALT (DRILLERS DESCRIPTION)	948.2	1																	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE TO SOME GRAVEL, CONTAINS TRACE IRON STAINING, DAMP		2	5 8 7	20	33	SS-1	4.50	-	-	-	-	-	-	-	-	20	A-6a (V)	110	
		3	5 5 6	15	33	SS-2	4.50	21	11	12	37	19	31	20	11	14	A-6a (5)	-	
	943.5	4	6 8 10	25	44	SS-3	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	942.0	5	4 5 7	16	78	SS-4	4.50	2	3	8	48	39	39	20	19	19	A-6b (12)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 651+47, 6' RT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 946.2 (MSL) EOB: 26.5 ft.
START: 9/30/21 END: 9/30/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.155985, -81.626548

EXPLORATION ID B-023-1-20

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)	BACK FILL
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, LITTLE SILT, TRACE CLAY, MOIST	946.2																	
	941.7	1 2 3 4	4 7 11	25	100	SS-1	-	21	24	31	15	9	NP	NP	NP	12	A-3a (0)	
VERY STIFF TO HARD, GRAY AND BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP TO MOIST		5 6 7	5 5 8	18	100	SS-2	4.50	-	-	-	-	-	-	-	-	18	A-6a (V)	
		8 9	3 5 6	15	100	SS-3	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	
		10 11 12	3 4 7	15	67	SS-4	4.25	-	-	-	-	-	-	-	-	13	A-6a (V)	
		13 14	4 4 5	12	72	SS-5	3.50	5	9	9	44	33	30	18	12	18	A-6a (9)	
		15 16 17	3 4 8	16	100	SS-6	4.50	9	13	12	40	26	30	18	12	15	A-6a (7)	
		18 19	2 4 5	12	100	SS-7	3.50	-	-	-	-	-	-	-	-	23	A-6a (V)	
		20 21 22	3 3 4	10	83	SS-8	4.25	-	-	-	-	-	-	-	-	22	A-6a (V)	
	924.2	23 24	2 5 8	18	100	SS-9	-	-	-	-	-	-	-	-	-	7	A-3a (V)	
MEDIUM DENSE, GRAY AND BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, DAMP	919.7	25 26 EOB	2 3 6	12	33	SS-10	-	-	-	-	-	-	-	-	-	9	A-3a (V)	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 659+89, 71' RT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 962.1 (MSL) EOB: 52.0 ft.
START: 2/1/22 END: 2/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.158278, -81.626003

EXPLORATION ID B-023-2-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 962.1	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	960.6																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, TRACE SILT, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP	959.1		30 15 11	29	89	SS-1	-	-	-	-	-	-	-	-	-	4	A-3a (V)	-	
HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP			2 4 6	11	61	SS-2	4.50	2	5	8	44	41	32	20	12	13	A-6a (9)	-	
			5 4 4	9	83	SS-3	4.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
			6 6 7	15	81	SS-4	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
			7 9 9	20	83	SS-5	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	-	
SS-6 CONTAINS NO RECOVERY			9 11 14	28	0	SS-6	-	-	-	-	-	-	-	-	-	-		-	
			10 9 10	21	33	SS-7	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
			6 11 12	26	33	SS-8	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
			6 8 13	24	78	SS-9	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 659+89, 71' RT.	START: 2/1/22	END: 2/1/22	PG 2 OF 2	B-023-2-20

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
HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP *(continued)*	932.1	31																	
		32	5 9 12	24	89	SS-10	4.25	-	-	-	-	-	-	-	-	20	A-6a (V)	-	
		33																	
		34	6 10 12	25	100	SS-11	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
	926.6	35																	
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, CONTAINS IRON STAINING, DAMP		36	7 8 10	20	100	SS-12	4.50	14	9	19	44	14	28	22	6	19	A-4a (5)	-	
	924.1	37																	
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, CONTAINS IRON STAINING, DAMP		38																	
		39	8 11 10	24	83	SS-13	-	25	27	17	16	15	NP	NP	NP	12	A-2-4 (0)	-	
	921.6	40																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS LAYERS OF SANDY SILT, CONTAINS IRON STAINING, DAMP		41	11 9 8	19	89	SS-14	-	-	-	-	-	-	-	-	-	12	A-3a (V)	-	
	919.1	42																	
VERY DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS LAYERS OF SANDY SILT, CONTAINS IRON STAINING, DAMP		43																	
		44	13 50	-	25	SS-15	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	-	
	916.6	45																	
DENSE, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST		46	9 16 16	36	33	SS-16	-	2	4	49	34	11	NP	NP	NP	15	A-4a (2)	-	
	914.1	47																	
DENSE, TAN, **STONE FRAGMENTS**, LITTLE SAND, TRACE SILT, TRACE CLAY, DAMP		48																	
		49	15 12 18	34	17	SS-17	-	-	-	-	-	-	-	-	-	1	A-1-a (V)	-	
	912.1	50																	
DENSE, GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP		W 911.1	12 13 16 16	33	75	SS-18	-	42	22	15	15	6	NP	NP	NP	8	A-1-b (0)	-	
	910.1	51																	
		EOB 52																	

NOTES: GROUNDWATER ENCOUNTERED AT 51.0' DURING DRILLING. HOLE CAVE-IN AT 34.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 659+91, 71' LT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 961.8 (MSL) EOB: 40.0 ft.
START: 2/1/22 END: 2/2/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.158290, -81.626518

EXPLORATION ID B-023-3-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 961.8	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	960.3	1	40 33 11	50	78	SS-1	4.50	-	-	-	-	-	-	-	-	7	A-4a (V)	-	
HARD, BROWN, **SANDY SILT**, LITTLE GRAVEL AND STONE FRAGMENTS, TRACE CLAY, CONTAINS IRON STAINING, DAMP	958.8	2																	
HARD, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP		3																	
		4	7 8 6	16	75	SS-2	4.50	3	10	13	40	34	28	18	10	14	A-4a (8)	-	
		5																	
		6																	
		7																	
		8																	
		9	6 4 5	10	86	SS-3	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
		10																	
		11	3 5 6	12	78	SS-4	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
		12																	
		13																	
		14	5 7 8	17	89	SS-5	4.50	-	-	-	-	-	-	-	-	14	A-4a (V)	-	
		15																	
		16	5 7 8	17	78	SS-6	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
		17																	
		18																	
		19	5 7 9	18	67	SS-7	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
	941.3	20																	
HARD, BROWN WITH GRAY MOTTLES, **SILT**, SOME SAND, LITTLE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP		21																	
		22	6 10 11	24	100	SS-8	4.50	8	8	19	51	14	26	20	6	15	A-4b (6)	-	
		23																	
		24	10 8 9	19	78	SS-9	4.50	-	-	-	-	-	-	-	-	9	A-4b (V)	-	
	936.3	25																	
VERY DENSE, TAN AND GRAY, **STONE FRAGMENTS**, LITTLE SAND, TRACE SILT, TRACE CLAY, DAMP		26																	
	933.8	27	19 25 25	56	0	SS-10	-	-	-	-	-	-	-	-	-	2	A-1-a (V)	-	
		28																	
VERY DENSE, ORANGISH BROWN, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET		29	36 38 10	54	39	SS-11	-	0	1	1	82	16	NP	NP	NP	23	A-4b (8)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 659+91, 71' LT.	START: 2/1/22	END: 2/2/22	PG 2 OF 2	B-023-3-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 931.8	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
MEDIUM DENSE, ORANGISH BROWN AND BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	931.3	31	5 7 8	17	89	SS-12	-	-	-	-	-	-	-	-	-	14	A-3a (V)	-	
HARD, BROWN MOTTLED WITH ORANGISH BROWN, **SILT**, LITTLE CLAY, LITTLE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, WET	928.8	32 33 34	4 6 7	15	100	SS-13	4.25	-	-	-	-	-	-	-	-	21	A-4b (V)	-	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	926.3	35 36 37	4 5 6	12	89	SS-14	-	0	5	67	23	5	NP	NP	NP	8	A-3a (0)	-	
	921.8	EOB 38 39 40	4 4 5	10	100	SS-15	-	-	-	-	-	-	-	-	-	5	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE CAVE-IN AT 28.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 660+27, 14' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 962.0 (MSL) EOB: 7.5 ft.
START: 9/1/20 END: 9/1/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.158386, -81.626310

EXPLORATION ID B-024-0-20

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
VERY DENSE, GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND**, TRACE SILT, TRACE CLAY, CONTAINS SLAG, DAMP **(FILL)**	962.0																		
	961.0	1	7 30 30	82	67	SS-1A	-	-	-	-	-	-	-	-	-	10	A-1-b (V)	2000	
						SS-1B	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
HARD, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	959.0	2	7 11 15	35	100	SS-2	4.50	5	8	15	41	31	30	18	12	14	A-6a (8)	-	
		3	4 6 7	18	56	SS-3	4.50	3	6	14	41	36	35	19	16	17	A-6b (10)	-	
HARD, BROWN AND GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP		4	3 6 8	19	100	SS-4	4.50	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
		5																	
		6	4 6 11	23	100	SS-5	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
	954.5	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12
TYPE: SUBGRADE
PID: 111404 SFN:
START: 8/8/20 END: 8/8/20

DRILLING FIRM / OPERATOR: NEAS / J. HODGES
SAMPLING FIRM / LOGGER: NEAS / J. HODGES
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55X
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 12/5/19
ENERGY RATIO (%): 81.9

STATION / OFFSET: 664+36, 39' RT.
ALIGNMENT: IR-77
ELEVATION: 973.1 (MSL) EOB: 7.5 ft.
LAT / LONG: 41.159507, -81.626093

EXPLORATION ID B-025-0-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 973.1	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
10.0" ASPHALT (DRILLERS DESCRIPTION)	972.3																		
VERY STIFF TO HARD, BROWN MOTTLED WITH GRAY AND ORANGISH BROWN, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST	968.6	1	4 4 6	14	33	SS-1	4.50	2	3	11	52	32	28	18	10	20	A-4b (8)	-	
		2	4 4 5	12	67	SS-2	2.75	-	-	-	-	-	-	-	-	19	A-4b (V)	110	
VERY STIFF, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP TO MOIST	965.6	3	5 9 12	29	44	SS-3	3.50	16	28	19	24	13	24	16	8	13	A-4a (0)	-	
		4	6 6 3	12	67	SS-4	3.25	-	-	-	-	-	-	-	-	22	A-4a (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 662+79, 71' RT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 968.8 (MSL) EOB: 46.0 ft.
START: 2/1/22 END: 2/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.159075, -81.625985

EXPLORATION ID B-025-1-20

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 968.8	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	967.3																		
HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP		1	39 15 8	26	89	SS-1	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		2																	
		3																	
		4	6 7 9	18	72	SS-2	4.50	7	7	9	40	37	31	19	12	13	A-6a (9)	-	
		5																	
		6																	
		7																	
		8																	
		9	4 6 12	20	78	SS-3	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	-	
		10																	
		11																	
		12																	
		13																	
		14	6 8 11	21	89	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		15																	
		16	6 8 9	19	83	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		17																	
		18																	
		19	4 6 9	17	89	SS-6	4.50	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
		20																	
		21	7 9 13	25	92	SS-7	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		22																	
		23																	
		24	8 9 13	25	89	SS-8	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		25																	
		26	8 11 12	26	89	SS-9	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		27																	
		28																	
	939.8	29	6 10 13	26	89	SS-10A	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
						SS-10B	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 662+79, 71' RT.	START: 2/1/22	END: 2/1/22	PG 2 OF 2	B-025-1-20

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
MEDIUM DENSE, ORANGISH BROWN AND GRAY, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, DAMP *(continued)*	938.8	31																	
		32	6 8 7	17	94	SS-11	-	20	39	16	16	9	NP	NP	NP	6	A-1-b (0)	-	
		33																	
		34	5 6 8	16	78	SS-12	-	31	35	17	12	5	NP	NP	NP	3	A-1-b (0)	-	
	933.3	35																	
STIFF TO VERY STIFF, GRAY, **SILT**, LITTLE CLAY, LITTLE SAND, TRACE GRAVEL, CONTAINS ROOT HAIRS, WET		36	3 4 4	9	100	SS-13	1.50	0	0	20	60	20	26	19	7	24	A-4b (8)	-	
		37																	
		38																	
		39	2 2 3	6	100	SS-14	3.00	-	-	-	-	-	-	-	-	23	A-4b (V)	-	
	928.3	40																	
MEDIUM DENSE, ORANGISH BROWN AND GRAY, **GRAVEL AND STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, MOIST		W 927.8 41																	
		42	4 5 9	16	72	SS-15	-	38	23	22	12	5	NP	NP	NP	13	A-1-b (0)	-	
		43																	
		44																	
		45	5 11 11 12	25	79	SS-16	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	-	
	922.8	EOB 46																	

NOTES: GROUNDWATER ENCOUNTERED AT 41.0' DURING DRILLING. HOLE CAVE-IN AT 30.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: GPD / JT	DRILL RIG: CME 55	STATION / OFFSET: 664+86, 71' LT.
TYPE: CULVERT	SAMPLING FIRM / LOGGER: NEAS / D. CAMPANA	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 1/26/22	ELEVATION: 974.0 (MSL) EOB: 44.0 ft.
START: 2/1/22 END: 2/1/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 67.6	LAT / LONG: 41.159648, -81.626488

EXPLORATION ID B-025-2-20

PAGE 1 OF 2

MATERIAL DESCRIPTION AND NOTES	ELEV. 974.0	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	972.5	1	32 26 11	42	97	SS-1	-	16	32	43	7	2	NP	NP	NP	5	A-3 (0)	-	
DENSE, BROWN, **FINE SAND**, SOME COARSE SAND, LITTLE GRAVEL, TRACE SILT, TRACE CLAY, DAMP **(FILL)**	971.0	2																	
VERY STIFF TO HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, CONTAINS TRACE BRICK FRAGMENTS, DAMP **(FILL)**		3																	
		4	4 5 5	11	61	SS-2	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		5																	
		6																	
		7																	
		8																	
		9	6 7 10	19	81	SS-3	4.50	4	7	11	46	32	29	16	13	14	A-6a (9)	-	
		10																	
SS-4 CONTAINS NO RECOVERY		11	6 7 8	17	0	SS-4	-	-	-	-	-	-	-	-	-	-		-	
		12																	
		13																	
		14	4 5 5	11	72	SS-5	3.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		15																	
		16	5 5 8	15	86	SS-6	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		17																	
		18																	
		19	5 8 9	19	78	SS-7	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
	953.5	20																	
DENSE, GRAY, **SANDY SILT**, "AND" GRAVEL, SOME CLAY, POUNDED THROUGH A 1.5" WOOD FRAGMENT, DAMP **(FILL)**	951.0	21																	
		22	3 19 14	37	72	SS-8	-	39	12	10	16	23	NP	NP	NP	11	A-4a (1)	-	
		23																	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, SOME GRAVEL, DAMP	948.5	24	7 14 14	32	56	SS-9	4.50	21	14	20	28	17	24	13	11	10	A-6a (2)	-	
		25																	
HARD, GRAY, **SILTY CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP TO MOIST		26																	
		27	2 3 4	8	61	SS-10	4.50	3	10	14	24	49	40	21	19	19	A-6b (11)	-	
		28																	
		29	3 2 4	7	69	SS-11	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	-	

PID: 111404	SFN:	PROJECT: SUM-77-24.12	STATION / OFFSET: 664+86, 71' LT.	START: 2/1/22	END: 2/1/22	PG 2 OF 2	B-025-2-20

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
HARD, GRAY, **SILTY CLAY**, LITTLE TO SOME SAND, TRACE GRAVEL, DAMP TO MOIST *(continued)*	944.0	31																	
		32	5 9 9	20	92	SS-12	4.50	-	-	-	-	-	-	-	-	13	A-6b (V)	-	
		33																	
		34	5 6 9	17	83	SS-13	4.25	-	-	-	-	-	-	-	-	24	A-6b (V)	-	
	938.5	35																	
VERY STIFF TO HARD, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST		36	4 5 7	14	81	SS-14	4.50	1	0	2	70	27	29	17	12	23	A-6a (9)	-	
		37																	
		38																	
		39	3 4 6	11	89	SS-15	4.50	-	-	-	-	-	-	-	-	22	A-6a (V)	-	
		40																	
		41	3 7 6	15	100	SS-16	4.25	-	-	-	-	-	-	-	-	22	A-6a (V)	-	
		42																	
	930.0	43	8 8 11	21	83	SS-17	4.00	-	-	-	-	-	-	-	-	24	A-6a (V)	-	
	EOB	44																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE CAVE-IN AT 31.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 668+28, 33' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 982.2 (MSL) EOB: 7.5 ft.
START: 9/1/20 END: 9/1/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.160587, -81.626331

EXPLORATION ID B-026-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 982.2	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
HARD, BROWN, **SANDY SILT**, SOME CLAY, LITTLE GRAVEL, DAMP	980.7	1	2 3 5	11	67	SS-1	4.50	13	15	18	33	21	23	16	7	11	A-4a (4)	110	
VERY STIFF TO HARD, BROWN AND GRAY, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, DAMP TO WET	978.7	2	10 12 14	35	78	SS-2	4.50	0	0	2	75	23	25	19	6	16	A-4b (8)	-	
		3	5 7 8	20	100	SS-3A	3.50	-	-	-	-	-	-	-	-	26	A-4b (V)	-	
						SS-3B	-	-	-	-	-	-	-	-	-	10	A-3 (V)	-	
MEDIUM DENSE, BROWN, **FINE SAND**, LITTLE COARSE SAND, TRACE TO LITTLE GRAVEL, TRACE SILT, TRACE CLAY, DAMP		4	6 7 8	20	100	SS-4	-	-	-	-	-	-	-	-	-	10	A-3 (V)	-	
		5	5 7 9	22	100	SS-5	-	-	-	-	-	-	-	-	-	7	A-3 (V)	-	
	974.7	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 672+27, 30' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 990.9 (MSL) EOB: 7.5 ft.
START: 9/1/20 END: 9/1/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.161679, -81.626075

EXPLORATION ID B-027-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 990.9	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
MEDIUM DENSE, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS TRACE ROOTS, DAMP	989.4	1	3 5 5	14	78	SS-1	-	6	13	40	28	13	NP	NP	NP	10	A-4a (1)	<100	
MEDIUM DENSE, BROWN, **SILT**, LITTLE CLAY, TRACE SAND, TRACE GRAVEL, WET	987.9	2 3	5 5 7	16	100	SS-2	-	1	0	2	85	12	NP	NP	NP	25	A-4b (8)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, MOIST	986.4	4	5 5 5	14	100	SS-3	-	-	-	-	-	-	-	-	-	15	A-3a (V)	-	
LOOSE, BROWN, **SANDY SILT**, TRACE CLAY, TRACE GRAVEL, WET	984.9	5 6	2 3 4	10	100	SS-4	-	-	-	-	-	-	-	-	-	22	A-4a (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE GRAVEL, TRACE CLAY, DAMP	983.4	7	2 3 5	11	100	SS-5	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
EOB																			

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 676+34, 39' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 999.0 (MSL) EOB: 7.5 ft.
START: 11/19/20 END: 11/19/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.162798, -81.626303

EXPLORATION ID B-028-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 999.0	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	997.5																		
HARD, BROWNISH GRAY, **SANDY SILT**, SOME CLAY, TRACE TO LITTLE GRAVEL, DAMP		1	5 4 4	11	100	SS-1	4.50	16	12	17	33	22	22	15	7	13	A-4a (4)	<100	
	994.5	2	4 5 7	16	89	SS-2	4.50	7	8	13	42	30	26	17	9	14	A-4a (7)	-	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		3 4 5	4 6 7	18	22	SS-3	3.00	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
	991.5	6 7 EOB	3 7 10	23	22	SS-4	2.25	-	-	-	-	-	-	-	-	15	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 680+33, 71' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1001.8 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.163887, -81.625879

EXPLORATION ID B-029-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1001.8	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	1000.7																		
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP	997.3	1–4	5 7 8	20	56	SS-1	-	-	-	-	-	-	-	-	-	8	A-2-4 (V)	80	
			5 8 11	26	50	SS-2	-	24	25	22	22	7	NP	NP	NP	6	A-2-4 (0)	-	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, DAMP	995.8	5	8 9 9	25	78	SS-3	-	20	27	21	23	9	19	13	6	12	A-2-4 (0)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, TRACE SILT, TRACE CLAY, DAMP	994.3	6–7 EOB	6 7 12	26	100	SS-4	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 684+31, 29' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1002.6 (MSL) EOB: 7.5 ft.
START: 9/1/20 END: 9/1/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.164983, -81.626217

EXPLORATION ID B-030-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1002.6	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
HARD, GRAYISH BROWN, **SANDY SILT**, SOME CLAY, LITTLE GRAVEL, CONTAINS IRON STAINING, DAMP	1001.1	1	2 5 6	15	78	SS-1	4.50	14	13	15	36	22	28	18	10	12	A-4a (5)	5500	
HARD, GRAY, **SILT AND CLAY**, LITTLE GRAVEL, LITTLE SAND, DAMP		2	7 7 12	26	67	SS-2	4.50	18	7	9	38	28	28	17	11	12	A-6a (7)	-	
		3	4 6 8	19	100	SS-3	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		4	3 4 5	12	100	SS-4	4.25	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
	995.1	5	3 4 5	12	100	SS-5	4.25	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 688+28, 41' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1006.3 (MSL) EOB: 7.5 ft.
START: 8/8/20 END: 8/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.166071, -81.625940

EXPLORATION ID B-031-0-20

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
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP	1006.3																		
	1003.3	1	5 5 8	18	44	SS-1	-	12	32	32	13	11	26	16	10	14	A-2-4 (0)	-	
STIFF TO HARD, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, MOIST TO WET		2	3 5 9	19	50	SS-2	2.00	0	0	21	46	33	26	17	9	21	A-4a (8)	-	
		3	4 4 5	12	28	SS-3	4.50	-	-	-	-	-	-	-	-	24	A-4a (V)	-	
	998.8	4	4 6 5	15	28	SS-4	3.00	-	-	-	-	-	-	-	-	26	A-4a (V)	-	
		EOB 5																	
		6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 692+52, 26' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1007.1 (MSL) EOB: 7.5 ft.
START: 9/2/20 END: 9/2/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.167183, -81.626158

EXPLORATION ID B-032-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1007.1	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
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE TO LITTLE GRAVEL, CONTAINS TRACE ROOTS, DAMP		1	2 1 3	5	44	SS-1	2.25	16	12	16	36	20	32	20	12	17	A-6a (5)	<100	
		2	6 7 11	25	89	SS-2	4.50	6	7	12	43	32	33	18	15	15	A-6a (10)	-	
	1002.6	3	5 7 9	22	100	SS-3	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
VERY STIFF, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, MOIST		4	3 3 5	11	100	SS-4	4.00	-	-	-	-	-	-	-	-	20	A-4a (V)	-	
	999.6	5 EOB	2 3 5	11	100	SS-5	3.25	-	-	-	-	-	-	-	-	21	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 696+54, 35' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1009.6 (MSL) EOB: 7.5 ft.
START: 8/28/20 END: 8/28/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.168283, -81.625917

EXPLORATION ID B-033-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1009.6	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1008.1																		
HARD, BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE TO LITTLE GRAVEL, DAMP		1	6 8 10	25	67	SS-1	4.50	14	6	12	38	30	32	18	14	13	A-6a (8)	1400	
		2	4 6 6	16	67	SS-2	4.50	6	15	18	37	24	28	17	11	12	A-6a (6)	-	
		3	4 5 7	16	67	SS-3	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		4	2 5 8	18	78	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
	1002.1	5 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 701+52, 23' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1014.7 (MSL) EOB: 7.5 ft.
START: 11/19/20 END: 11/19/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.169652, -81.626097

EXPLORATION ID B-034-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1014.7	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1013.2	1																	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE TO LITTLE GRAVEL, DAMP	1010.2	2 3 4	2 5 6	15	44	SS-1	4.50	20	11	26	28	15	25	15	10	12	A-4a (2)	310	
			4 4 5	12	100	SS-2	4.25	10	13	30	29	18	25	15	10	13	A-4a (2)	-	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP	1007.2	5 6	4 4 6	14	100	SS-3	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
	EOB	7	4 5 6	15	100	SS-4	4.50	-	-	-	-	-	-	-	-	17	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 705+15, 25' RT.	EXPLORATION ID B-035-0-20	
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77		
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1021.6 (MSL) EOB: 7.5 ft.	PAGE 1 OF 1	
START: 9/2/20 END: 9/2/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.170645, -81.625902		

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
STIFF TO HARD, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE TO SOME GRAVEL, DAMP TO MOIST @0.0' - 1.5'; CONTAINS TRACE ROOTS AND IRON STAINING	1021.6	1	2 3 4	10	78	SS-1	4.50	17	8	14	38	23	32	18	14	16	A-6a (7)	193	
		2	12 9 9	25	67	SS-2	4.50	25	12	13	30	20	31	19	12	12	A-6a (4)	-	
		3 4	7 9 11	27	11	SS-3	1.50	-	-	-	-	-	-	-	-	24	A-6a (V)	-	
		5	3 4 6	14	67	SS-4	3.00	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	1014.1	6 7 EOB	2 4 8	16	67	SS-5	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 708+46, 32' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1031.1 (MSL) EOB: 7.5 ft.
START: 11/19/20 END: 11/19/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.171556, -81.626090

EXPLORATION ID B-036-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1031.1	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
HARD, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1029.6	1	2 3 4	10	67	SS-1	4.50	17	21	19	28	15	26	17	9	15	A-4a (2)	<100	
HARD, BROWN MOTTLED WITH GRAY, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS ROOTS, DAMP	1026.6	2 3 4	5 6 10	22	67	SS-2	4.50	7	10	16	40	27	34	18	16	15	A-6b (9)	-	
			5 7 10	23	78	SS-3	4.50	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP	1023.6	5 6 7	9 6 7	18	89	SS-4	4.50	15	13	15	37	20	34	19	15	12	A-6a (6)	-	
		EOB	4 5 8	18	100	SS-5	4.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 712+59, 47' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1044.8 (MSL) EOB: 7.5 ft.
START: 12/9/20 END: 12/9/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.172685, -81.625780

EXPLORATION ID B-037-0-20

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
9.0" ASPHALT AND 9.0" CONCRETE (DRILLERS DESCRIPTION)	1044.8 1043.3	1																	
STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS NO INTACT SOIL FOR HP READINGS, MOIST	1041.8	2	4 4 6	14	39	SS-1	-	-	-	-	-	-	-	-	-	18	A-6a (V)	380	
HARD, BROWN MOTTLED WITH GRAY, **SILTY CLAY**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1040.3	3 4	4 5 7	16	44	SS-2	4.50	18	7	8	36	31	39	22	17	17	A-6b (9)	-	
VERY STIFF TO HARD, BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP		5 6	5 8 9	23	39	SS-3	3.50	22	20	17	27	14	29	19	10	11	A-4a (1)	-	
	1037.3	7 EOB	5 8 8	22	89	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 716+54, 34' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1055.8 (MSL) EOB: 7.5 ft.
START: 9/2/20 END: 9/2/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.173774, -81.626052

EXPLORATION ID B-038-0-20

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
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	1055.8	1	2 3 4	10	78	SS-1	4.50	10	16	18	36	20	31	19	12	13	A-6a (5)	160	
		2	8 8 12	27	67	SS-2	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
		3	3 4 7	15	100	SS-3	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		4	7 8 11	26	100	SS-4	4.50	2	9	14	43	32	30	19	11	13	A-6a (8)	-	
		5	8 8 10	25	100	SS-5	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
	1048.3	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 720+49, 34' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1067.4 (MSL) EOB: 7.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.174855, -81.625783

EXPLORATION ID B-039-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1067.4	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
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP	1062.9	1	2 3 5	11	89	SS-1	4.50	10	11	15	39	25	30	17	13	13	A-6a (7)	230	
		2	12 13 15	38	100	SS-2	4.50	-	-	-	-	-	-	-	-	11	A-6a (V)	-	
		3	5 6 7	18	100	SS-3	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
HARD, ORANGISH BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, CONTAINS IRON STAINING, DAMP	1059.9	4	5 6 7	18	100	SS-4	4.50	14	10	31	31	14	22	15	7	12	A-4a (2)	-	
		5	7 7 7	19	100	SS-5	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
		6																	
	EOB	7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 724+53, 41' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1080.3 (MSL) EOB: 7.5 ft.
START: 11/17/20 END: 11/17/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.175966, -81.626032

EXPLORATION ID B-040-0-20

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
VERY STIFF, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1080.3	1																	
		2	8 16 7	31	100	SS-1	3.00	16	15	29	28	12	18	13	5	11	A-4a (1)	40	
	1077.3	3																	
DENSE, BROWN BECOMING GRAY, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP		4	8 10 15	34	100	SS-2	-	19	13	27	28	13	NP	NP	NP	10	A-4a (1)	-	
		5	12 15 15	41	100	SS-3	-	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
		6																	
	1072.8	7	9 12 12	33	100	SS-4	-	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 728+54, 33' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1091.5 (MSL) EOB: 6.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.177063, -81.625741

EXPLORATION ID B-041-0-20

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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
MEDIUM DENSE, GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, STONE FRAGMENTS ARE VERY WEAK LAMINATED SILTY SHALE, DAMP	1091.5	1	5 7 15	30	33	SS-1	-	-	-	-	-	-	-	-	-	7	A-2-4 (V)	<100	
VERY DENSE, GRAY, **STONE FRAGMENTS**, LITTLE SAND, TRACE SILT, TRACE CLAY, STONE FRAGMENTS ARE VERY WEAK LAMINATED SILTY SHALE, DAMP	1090.0	2	50	-	18	SS-2	-	-	-	-	-	-	-	-	-	7	A-1-a (V)	-	
HARD, GRAY, **CLAY**, SOME SILT, SOME STONE FRAGMENTS, SOME SAND, STONE FRAGMENTS ARE VERY WEAK LAMINATED SILTY SHALE, DAMP	1088.5	3 4	6 18 20	52	67	SS-3	4.25	31	13	11	33	12	41	25	16	13	A-7-6 (4)	-	
VERY DENSE, GRAY, **STONE FRAGMENTS**, LITTLE SAND, TRACE SILT, TRACE CLAY, STONE FRAGMENTS ARE VERY WEAK LAMINATED SILTY SHALE, DAMP	1085.5	5	10 20 28	66	56	SS-4	4.50	-	-	-	-	-	-	-	-	8	A-7-6 (V)	-	
	1085.0 EOB	6	50	-	50	SS-5	-	-	-	-	-	-	-	-	-	6	A-1-a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 732+51, 71' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1104.1 (MSL) EOB: 6.5 ft.
START: 11/17/20 END: 11/17/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.178158, -81.626097

EXPLORATION ID B-042-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1104.1	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1102.6																		
MEDIUM DENSE, BROWN, **STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, STONE FRAGMENTS ARE SHALE, DAMP	1101.1	TR	5 7 14	29	89	SS-1	-	32	21	13	25	9	22	16	6	8	A-2-4 (0)	150	
SHALE, BROWNISH GRAY, MODERATELY WEATHERED, WEAK TO MODERATELY STRONG, FISSILE, SILTY.			9 36 50/4"	-	75	SS-2	-	-	-	-	-	-	-	-	-	8	Rock (V)	-	
			9 50/5"	-	73	SS-3	-	-	-	-	-	-	-	-	-	6	Rock (V)	-	
	1097.6	EOB	50	-	67	SS-4	-	-	-	-	-	-	-	-	-	-	Rock (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 736+56, 40' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1116.6 (MSL) EOB: 7.5 ft.
START: 12/9/20 END: 12/9/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.179263, -81.625669

EXPLORATION ID B-043-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1116.6	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
9.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	1115.5																		
MEDIUM DENSE, BROWN AND BLACK, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, DAMP	1113.6	1	4 6 6	16	67	SS-1	-	25	28	23	19	5	NP	NP	NP	8	A-1-b (0)	<100	
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, MOIST TO DAMP	1110.6	2 3 4 5	4 5 15	27	22	SS-2	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	-	
			6 8 10	25	22	SS-3	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE CLAY, LITTLE GRAVEL, MOIST	1109.1	6 7 EOB	7 7 6	18	39	SS-4	-	-	-	-	-	-	-	-	-	11	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 740+56, 34' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1127.6 (MSL) EOB: 7.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.180365, -81.625916

EXPLORATION ID B-044-0-20

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
HARD, BROWN, **SANDY SILT**, LITTLE TO SOME CLAY, LITTLE TO SOME GRAVEL, CONTAINS ROOTS AND IRON STAINING, DAMP	1127.6	1	1 2 3	7	44	SS-1	4.50	21	9	11	38	21	29	21	8	14	A-4a (5)	67	
		2	4 4 4	11	94	SS-2	4.25	12	11	15	42	20	25	18	7	15	A-4a (5)	-	
SOFT, DARK BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MODERATELY ORGANIC, CONTAINS MANY ROOTS, RESEMBLES TOPSOIL, CONTAINS NO INTACT SOIL FOR HP READINGS, MOIST	1124.6	3	1 1 1	3	22	SS-3	-	-	-	-	-	-	-	-	-	23	A-4a (V)	-	
MEDIUM DENSE, GRAY AND BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY**, DAMP	1123.1	4	5 7 9	22	56	SS-4	-	-	-	-	-	-	-	-	-	12	A-2-6 (V)	-	
@6.0' - 7.5'; CONTAINS A RELIC ROCK STRUCTURE	1120.1	5	3 4 10	19	67	SS-5	-	-	-	-	-	-	-	-	-	9	A-2-6 (V)	-	
	EOB	6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 744+53, 32' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1139.4 (MSL) EOB: 7.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.181451, -81.625652

EXPLORATION ID B-045-0-20

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
VERY STIFF TO HARD, ORANGISH BROWN AND BROWN, **SANDY SILT**, LITTLE TO SOME GRAVEL AND STONE FRAGMENTS, LITTLE CLAY, CONTAINS IRON STAINING, DAMP	1139.4	1	10 6 5	15	78	SS-1	4.50	24	9	15	33	19	25	18	7	13	A-4a (3)	170	
		2	6 5 6	15	100	SS-2	4.25	12	11	28	33	16	21	15	6	12	A-4a (3)	-	
		3	3 3 5	11	100	SS-3	2.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
		4	2 6 8	19	100	SS-4	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
	1133.4	5																	
HARD, GRAY, **SILT AND CLAY**, SOME SAND, LITTLE STONE FRAGMENTS, DAMP	1131.9	6	3 6 9	20	100	SS-5	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
		7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 748+52, 41' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1152.3 (MSL) EOB: 7.5 ft.
START: 11/17/20 END: 11/17/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.182548, -81.625897

EXPLORATION ID B-046-0-20

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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
VERY STIFF TO HARD, BROWN, **SANDY SILT**, LITTLE TO SOME CLAY, TRACE GRAVEL, DAMP	1152.3	1																	
		2	3 3 5	11	67	SS-1	2.25	9	18	25	32	16	23	14	9	13	A-4a (3)	110	
		3	3 7 8	20	100	SS-2	4.50	6	8	19	43	24	27	17	10	14	A-4a (6)	-	
		4	3 6 7	18	44	SS-3	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
		5	6 9 10	26	100	SS-4	4.50	-	-	-	-	-	-	-	-	15	A-4a (V)	-	
	1144.8	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 752+52, 32' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1162.3 (MSL) EOB: 7.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.183645, -81.625610

EXPLORATION ID B-047-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1162.3	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
HARD, BROWN, **SANDY SILT**, SOME CLAY, LITTLE GRAVEL, CONTAINS ROOTS, DAMP	1159.3	1	2 5 7	16	100	SS-1	4.50	13	8	23	34	22	25	16	9	11	A-4a (4)	-	
		2	9 17 16	45	44	SS-2	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	110	
HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS GRAY DESSICATION CRACKS, DAMP	1157.8	3	3 6 9	20	100	SS-3	4.50	3	7	11	37	42	34	19	15	18	A-6a (10)	-	
VERY STIFF, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, MOIST	1156.3	5	5 5 7	16	100	SS-4	3.00	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP	1154.8	6 7 EOB	4 5 6	15	100	SS-5	4.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 756+55, 41' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1170.9 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.184752, -81.625850

EXPLORATION ID B-048-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1170.9	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
12.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	1169.6	1																	
MEDIUM DENSE, BROWN AND DARK GRAY, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS ASPHALT FRAGMENTS, DAMP **(FILL)**	1167.9	2	5 6 8	19	11	SS-1	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	110	
HARD, BROWN AND GRAY, **SILTY CLAY**, LITTLE SAND, LITTLE GRAVEL, DAMP TO MOIST		3	6 6 7	18	56	SS-2	4.50	12	7	13	39	29	34	17	17	15	A-6b (9)	-	
		4																	
		5	5 7 7	19	67	SS-3	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
		6																	
	1163.4	7 EOB	5 6 9	20	100	SS-4	4.50	-	-	-	-	-	-	-	-	21	A-6b (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 760+56, 31' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1174.8 (MSL) EOB: 7.5 ft.
START: 9/3/20 END: 9/3/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.185851, -81.625566

EXPLORATION ID B-049-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1174.8	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
VERY STIFF, BROWN, **SILTY CLAY**, SOME GRAVEL, LITTLE SAND, CONTAINS ROOT HAIRS, DAMP	1173.3	1	3 4 6	14	44	SS-1	3.75	23	7	12	34	24	39	20	19	17	A-6b (8)	490	
VERY STIFF TO HARD, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **CLAY**, "AND" SILT, LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST		2	6 8 10	25	67	SS-2	4.50	5	5	13	44	33	41	20	21	19	A-7-6 (13)	-	
		3	2 5 7	16	100	SS-3	4.25	-	-	-	-	-	-	-	-	17	A-7-6 (V)	-	
		4	2 3 6	12	100	SS-4	3.75	-	-	-	-	-	-	-	-	19	A-7-6 (V)	-	
	1167.3	5	2 4 5	12	100	SS-5	2.50	-	-	-	-	-	-	-	-	21	A-7-6 (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 764+57, 33' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1178.7 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.186953, -81.625775

EXPLORATION ID B-050-0-20

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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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1178.7																		
	1177.2	1																	
HARD, BROWN, **SANDY SILT**, SOME GRAVEL AND STONE FRAGMENTS, LITTLE CLAY, CONTAINS IRON STAINING, DAMP	1175.7	2	3 7 16	31	67	SS-1	4.50	30	16	15	25	14	27	18	9	11	A-4a (1)	<100	
HARD, BROWN, **SILTY CLAY**, SOME SAND, SOME GRAVEL AND STONE FRAGMENTS, DAMP		3	6 9 12	29	100	SS-2	4.50	22	12	13	33	20	36	20	16	11	A-6b (6)	-	
		4	7 11 12	31	100	SS-3	4.50	-	-	-	-	-	-	-	-	9	A-6b (V)	-	
		5	5 26 20	63	67	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-6b (V)	-	
	1171.2	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12
TYPE: SUBGRADE
PID: 111404 SFN:
START: 9/3/20 END: 9/3/20

DRILLING FIRM / OPERATOR: NEAS / J. HODGES
SAMPLING FIRM / LOGGER: NEAS / J. HODGES
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55X
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 12/5/19
ENERGY RATIO (%): 81.9

STATION / OFFSET: 768+59, 32' RT.
ALIGNMENT: IR-77
ELEVATION: 1181.9 (MSL) EOB: 7.5 ft.
LAT / LONG: 41.188054, -81.625516

EXPLORATION ID B-051-0-20

MATERIAL DESCRIPTION AND NOTES	ELEV. 1181.9	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1180.4	1																	
HARD, BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP	1177.4	2 3 4	6 9 14	31	44	SS-1	4.50	-	-	-	-	-	-	-	-	12	A-4a (V)	<100	
			4 16 7	31	44	SS-2	4.50	28	12	15	30	15	26	18	8	10	A-4a (2)	-	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, SOME GRAVEL, CONTAINS IRON STAINING, DAMP	1174.4	5 6	4 6 8	19	100	SS-3	4.50	21	10	14	34	21	31	17	14	12	A-6a (6)	-	
		7 EOB	5 6 10	22	100	SS-4	4.25	-	-	-	-	-	-	-	-	16	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 773+45, 23' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1183.0 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.189390, -81.625691

EXPLORATION ID B-052-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1183.0	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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1181.5	1																	
MEDIUM DENSE, BROWN AND GRAY, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	1180.0	2 3	7 7 5	16	56	SS-1	-	31	22	14	23	10	25	17	8	10	A-2-4 (0)	67	
MEDIUM DENSE, BROWN, **GRAVEL**, SOME SAND, TRACE SILT, TRACE CLAY, DAMP	1178.5	4	7 7 6	18	44	SS-2	-	54	21	11	10	4	NP	NP	NP	6	A-1-a (0)	-	
MEDIUM DENSE TO DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP	1175.5	5 6	2 15 18	45	33	SS-3	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	-	
	EOB	7	2 10 6	22	22	SS-4	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 777+09, 19' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1179.2 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.190388, -81.625523

EXPLORATION ID B-053-0-20

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
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, TRACE TO SOME GRAVEL, DAMP TO MOIST	1179.2	1	3 2 3	7	67	SS-1	4.00	25	13	13	31	18	36	22	14	17	A-6a (4)	<100	
		2	4 6 5	15	89	SS-2	4.50	8	7	10	47	28	34	21	13	19	A-6a (9)	-	
		3	4 6 9	20	100	SS-3	4.50	-	-	-	-	-	-	-	-	23	A-6a (V)	-	
		4	4 6 11	23	100	SS-4	4.50	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	1171.7	5	3 8 10	25	100	SS-5	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 781+04, 27' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1176.1 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.191470, -81.625686

EXPLORATION ID B-054-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1176.1	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
VERY STIFF, BROWN, **SILT AND CLAY**, "AND" SAND, LITTLE GRAVEL, CONTAINS ROOTS, DAMP	1174.6	1	2 2 4	8	44	SS-1	2.50	19	16	20	28	17	35	20	15	15	A-6a (4)	<100	
VERY STIFF TO HARD, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, DAMP		2	4 7 10	23	100	SS-2	4.50	5	8	14	44	29	28	18	10	15	A-4a (8)	-	
		3	3 5 6	15	100	SS-3	2.75	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
		4	4 5 6	15	100	SS-4	2.25	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
	1168.6	5 EOB	5 5 6	15	100	SS-5	2.25	-	-	-	-	-	-	-	-	16	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 784+58, 35' RT.	EXPLORATION ID B-055-0-20
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1173.2 (MSL) EOB: 7.5 ft.	PAGE 1 OF 1
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.192449, -81.625466	

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
STIFF TO HARD, BROWN, **SILTY CLAY**, LITTLE TO SOME SAND, TRACE TO LITTLE GRAVEL, CONTAINS TRACE ROOTS AND IRON STAINING, DAMP	1173.2	1	3 3 4	10	44	SS-1	1.50	14	12	19	31	24	39	22	17	20	A-6b (7)	120	
		2	3 5 6	15	67	SS-2	4.50	2	3	8	40	47	37	20	17	18	A-6b (11)	-	
		3	5 6 10	22	33	SS-3	3.25	-	-	-	-	-	-	-	-	18	A-6b (V)	-	
		4	5 5 6	15	100	SS-4	1.75	-	-	-	-	-	-	-	-	14	A-6b (V)	-	
		5	4 5 6	15	100	SS-5	4.50	-	-	-	-	-	-	-	-	12	A-6b (V)	-	
	1165.7	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 789+10, 34' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1168.1 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.193689, -81.625722

EXPLORATION ID B-056-0-20

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
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	1168.1																		
	1166.6	1	2 3 7	14	100	SS-1	2.50	10	9	17	39	25	30	17	13	14	A-6a (7)	350	
VERY STIFF TO HARD, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **SILTY CLAY**, SOME SAND, TRACE TO LITTLE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP		2	4 5 9	19	39	SS-2	3.75	11	9	20	37	23	37	20	17	17	A-6b (8)	-	
		3	6 7 10	23	100	SS-3	2.75	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
		4	3 4 6	14	100	SS-4	3.00	-	-	-	-	-	-	-	-	14	A-6b (V)	-	
		5	4 5 4	12	100	SS-5	4.50	-	-	-	-	-	-	-	-	16	A-6b (V)	-	
	1160.6	6 EOB																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 793+08, 72' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1164.9 (MSL) EOB: 7.5 ft.
START: 12/9/20 END: 12/9/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.194780, -81.625340

EXPLORATION ID B-057-0-20

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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1164.9 1163.4	1																	
MEDIUM DENSE, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1161.9	2 3	4 4 6	14	100	SS-1	-	18	18	14	36	14	NP	NP	NP	10	A-4a (3)	<100	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE GRAVEL, LITTLE CLAY, DAMP TO MOIST	1158.9	4 5 6	3 5 6	15	89	SS-2	-	17	27	26	19	11	NP	NP	NP	11	A-3a (0)	-	
			5 4 5	12	100	SS-3	-	-	-	-	-	-	-	-	-	18	A-3a (V)	-	
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST	1157.4	7	5 4 4	11	100	SS-4	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 797+10, 38' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1161.2 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.195883, -81.625746

EXPLORATION ID B-058-0-20

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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
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP	1161.2	1																	
	1158.2	2	7 4 4	11	56	SS-1	4.50	10	19	24	29	18	22	14	8	12	A-4a (2)	110	
STIFF TO VERY STIFF, BROWNISH GRAY, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST TO DAMP		3	2 3 3	8	67	SS-2	2.25	7	6	14	38	35	33	16	17	20	A-6b (10)	-	
		4	2 2 2	5	44	SS-3	2.00	-	-	-	-	-	-	-	-	15	A-6b (V)	-	
	1153.7	5	2 2 3	7	44	SS-4	3.00	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 799+87, 99' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1158.4 (MSL) EOB: 7.5 ft.
START: 10/20/20 END: 10/21/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.196643, -81.625252

EXPLORATION ID B-059-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1158.4	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
7.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1157.3																		
HARD, BROWN AND ORANGISH BROWN, **SILT AND CLAY**, "AND" SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP	1155.4		8 4 5	12	67	SS-1	4.50	7	14	27	31	21	26	15	11	13	A-6a (4)	110	
STIFF TO HARD, BROWN AND ORANGISH BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST			4 5 6	15	56	SS-2	4.25	5	11	31	32	21	24	14	10	14	A-4a (4)	-	
			5 3 4	10	44	SS-3	2.25	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
	1150.9	EOB	4 4 7	15	72	SS-4	2.00	-	-	-	-	-	-	-	-	20	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 805+10, 40' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1160.8 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.198078, -81.625761

EXPLORATION ID B-060-0-20

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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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1160.8																		
	1159.3	1																	
VERY STIFF, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1157.8	2	9 6 4	14	39	SS-1	3.50	15	16	30	26	13	18	13	5	11	A-4a (1)	-	
STIFF, BROWN AND GRAY, **SILT AND CLAY**, "AND" SAND, LITTLE GRAVEL, DAMP	1156.3	3 4	2 11 12	31	44	SS-2	1.50	11	9	29	31	20	27	15	12	15	A-6a (4)	-	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, DAMP	1153.3	5 6 7	6 7 8	20	39	SS-3	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	-	
	EOB		6 7 9	22	33	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 809+75, 34' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1162.0 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.199354, -81.625497

EXPLORATION ID B-061-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1162.0	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
STIFF TO VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP TO MOIST		1	2 3 3	8	78	SS-1	2.00	10	8	17	38	27	28	17	11	15	A-6a (6)	<100	
		2	2 3 5	11	56	SS-2	2.00	7	7	14	42	30	32	18	14	20	A-6a (9)	-	
	1157.5	3	3 4 4	11	89	SS-3	2.50	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP		4	5 6 8	19	100	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
	1154.5	5	4 6 9	20	100	SS-5	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 813+15, 40' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1164.5 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.200288, -81.625770

EXPLORATION ID B-062-0-20

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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
12.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1164.5																		
	1163.0	1																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, TRACE SILT, TRACE CLAY, DAMP	1161.7	2	11 15 6	29	44	SS-1	-	-	-	-	-	-	-	-	-	9	A-3a (V)	<100	
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP		3	6 9 11	27	67	SS-2	4.50	1	5	9	44	41	30	19	11	15	A-6a (8)	-	
		4																	
		5	6 10 14	33	78	SS-3	4.50	8	6	11	40	35	32	18	14	15	A-6a (10)	-	
		6																	
	1157.0	7 EOB	5 10 16	35	67	SS-4	4.50	-	-	-	-	-	-	-	-	14	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 816+93, 27' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1165.0 (MSL) EOB: 7.5 ft.
START: 11/16/20 END: 11/16/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.201325, -81.625530

EXPLORATION ID B-063-0-20

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
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	1165.0																		
	1163.5																		
STIFF TO VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND GRAY, **CLAY**, "AND" SILT, LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, MOIST		1	2 4 4	11	100	SS-1	2.25	14	13	20	29	24	30	17	13	17	A-6a (5)	140	
		2	2 2 4	8	100	SS-2	2.25	1	4	10	38	47	43	21	22	23	A-7-6 (13)	-	
		3	5 5 6	15	89	SS-3	1.50	-	-	-	-	-	-	-	-	24	A-7-6 (V)	-	
		4	4 7 6	18	100	SS-4	1.75	-	-	-	-	-	-	-	-	28	A-7-6 (V)	-	
		5	3 6 7	18	100	SS-5	3.75	-	-	-	-	-	-	-	-	23	A-7-6 (V)	-	
	1157.5	6																	
		7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 409+38, 50' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1015.5 (MSL) EOB: 7.5 ft.
START: 12/8/20 END: 12/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.147830, -81.636287

EXPLORATION ID B-064-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1015.5	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
10.0" ASPHALT AND 5.0" BASE (DRILLERS DESCRIPTION)	1014.2	1																	
HARD, GRAY, **SANDY SILT**, LITTLE TO SOME CLAY, TRACE GRAVEL, DAMP	1011.0	2 3 4	4 6 5	15	100	SS-1	4.50	9	8	24	37	22	26	16	10	15	A-4a (5)	<100	
			5 7 10	23	56	SS-2	4.50	9	9	29	34	19	24	16	8	14	A-4a (4)	-	
MEDIUM DENSE TO DENSE, GRAY, **STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, MOIST	1008.0	5	8 8 9	23	44	SS-3	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	-	
		6 7 EOB	10 11 18	40	56	SS-4	-	-	-	-	-	-	-	-	-	13	A-2-4 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 14+70, 17' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP S
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1016.2 (MSL) EOB: 7.5 ft.
START: 12/8/20 END: 12/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148952, -81.635057

EXPLORATION ID B-065-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1016.2	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
10.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	1015.0																		
HARD, GRAY AND BROWN, **SANDY SILT**, LITTLE TO SOME CLAY, TRACE TO LITTLE GRAVEL, DAMP		1	5 5 5	14	100	SS-1	4.50	9	5	20	44	22	27	19	8	16	A-4a (6)	<100	
		2																	
		3	4 4 7	15	89	SS-2	4.50	15	12	27	33	13	22	16	6	12	A-4a (2)	-	
		4																	
	1010.2	5	4 4 8	16	44	SS-3	4.50	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
DENSE, GRAY AND BROWN, **STONE FRAGMENTS**, SOME SAND, TRACE SILT, TRACE CLAY, STONE FRAGMENTS ARE FRIABLE SANDSTONE (POSSIBLE COBBLE), DAMP	1008.7	6	7 8 17	34	39	SS-4	-	-	-	-	-	-	-	-	-	11	A-1-a (V)	-	
		EOB 7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 18+82, 9' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP S
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1013.4 (MSL) EOB: 7.5 ft.
START: 11/8/20 END: 11/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149964, -81.634499

EXPLORATION ID B-066-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1013.4	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
8.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	1012.1	1																	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP	1010.4	2	4 7 8	20	100	SS-1	4.25	5	15	35	31	14	25	15	10	15	A-4a (2)	<100	
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST	1008.9	3 4	3 4 5	12	89	SS-2	2.50	7	13	20	41	19	29	18	11	19	A-6a (5)	-	
HARD, GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, MOIST	1007.4	5	4 4 8	16	44	SS-3	4.25	-	-	-	-	-	-	-	-	16	A-4a (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, SOME CLAY, TRACE GRAVEL, MOIST	1005.9	6 7 EOB	6 5 4	12	89	SS-4	-	-	-	-	-	-	-	-	-	15	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 22+92, 4' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP S
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1009.5 (MSL) EOB: 7.5 ft.
START: 11/8/20 END: 11/8/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151076, -81.634345

EXPLORATION ID B-067-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1009.5	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
8.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1008.3	1																	
LOOSE TO MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE TO LITTLE CLAY, DAMP	1005.0	2	3 4 6	14	100	SS-1	-	25	20	25	20	10	24	14	10	14	A-2-4 (0)	40	
		3	2 2 2	5	100	SS-2	-	20	21	26	21	12	24	16	8	13	A-2-4 (0)	-	
		4																	
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP	1003.5	5	2 3 5	11	100	SS-3	2.25	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		6																	
STIFF, ORANGISH BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS HEAVY IRON STAINING, MOIST	1002.0	7	3 4 8	16	100	SS-4	1.75	-	-	-	-	-	-	-	-	19	A-6b (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 225+67, 7' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP P
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 997.0 (MSL) EOB: 7.5 ft.
START: 12/7/20 END: 12/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150845, -81.631894

EXPLORATION ID B-068-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 997.0	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
8.0" ASPHALT AND 5.0" BASE (DRILLERS DESCRIPTION)	995.9																		
MEDIUM DENSE TO DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, LITTLE GRAVEL, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP		1 2 3 4 5 6 7	7 9 16	34	22	SS-1	-	-	-	-	-	-	-	-	-	9	A-3a (V)	830	
			6 12 8	27	56	SS-2	-	18	34	22	22	4	NP	NP	NP	7	A-3a (0)	-	
			4 7 10	23	44	SS-3	-	-	-	-	-	-	-	-	-	7	A-3a (V)	-	
	989.5	EOB	4 8 8	22	44	SS-4	-	-	-	-	-	-	-	-	-	8	A-3a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 221+81, 15' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP P
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1007.8 (MSL) EOB: 7.5 ft.
START: 11/7/20 END: 11/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150290, -81.633101

EXPLORATION ID B-069-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1007.8	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
8.0" ASPHALT AND 4.0" BASE (DRILLERS DESCRIPTION)	1006.8																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE TO LITTLE CLAY, CONTAINS IRON STAINING, DAMP		1	5 6 6	16	44	SS-1	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	<100	
		2	9 9 9	25	78	SS-2	-	24	25	22	22	7	21	16	5	11	A-2-4 (0)	-	
		3	3 5 4	12	100	SS-3	-	-	-	-	-	-	-	-	-	10	A-2-4 (V)	-	
		4	4 4 5	12	100	SS-4	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	-	
	1000.3	5 EOB																	
		6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 218+57, 15' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP P
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1009.4 (MSL) EOB: 7.5 ft.
START: 12/7/20 END: 12/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.150671, -81.634118

EXPLORATION ID B-070-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1009.4	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	SO4 ppm	BACK FILL
10.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1008.1	1																	
HARD, BROWN AND GRAY, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	1006.4	2	6 8 8	22	89	SS-1	4.50	20	18	17	31	14	25	17	8	13	A-4a (2)	<100	
VERY STIFF, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP	1003.4	3 4 5	6 4 6	14	100	SS-2	2.50	0	7	21	50	22	30	19	11	18	A-6a (8)	-	
			3 3 4	10	100	SS-3	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	-	
LOOSE, BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, MOIST	1001.9	6 7 EOB	3 3 2	7	106	SS-4	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / JL	DRILL RIG: CME 55T	STATION / OFFSET: 218+18, 88' LT.	EXPLORATION ID B-070-1-20
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / JL	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP P	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1007.0 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 9/21/21 END: 9/21/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 68.4	LAT / LONG: 41.150821, -81.633781	

MATERIAL DESCRIPTION AND NOTES	ELEV. 1007.0	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	BACK FILL
6.0" TOPSOIL (DRILLERS DESCRIPTION)	1006.5																	
LOOSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, TRACE TO LITTLE GRAVEL, TRACE CLAY, DAMP TO WET		1																
		2																
		3	4 3 4	8	67	SS-1	-	18	30	20	22	10	NP	NP	NP	10	A-3a (0)	
		4																
		5																
		6	1 2 2	5	100	SS-2	-	-	-	-	-	-	-	-	-	17	A-3a (V)	
	1000.0	7																
LOOSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP		8	0 3 5	9	83	SS-3	-	31	20	24	15	10	23	15	8	12	A-2-4 (0)	
	997.5	9																
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP		10																
		11	9 6 9	17	100	SS-4	-	21	47	20	10	2	NP	NP	NP	6	A-1-b (0)	
		12																
		13	7 7 9	18	100	SS-5	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		14																
		15																
		16	8 6 9	17	50	SS-6	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	
		17																
		18	7 8 8	18	56	SS-7	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		19																
		20																
		21	6 11 12	26	78	SS-8	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		22																
		23	4 9 13	25	89	SS-9	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		24																
		25																
	980.5	26	12 13 11	27	100	SS-10	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	
		EOB																

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 214+18, 17' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP P
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1003.7 (MSL) EOB: 7.5 ft.
START: 12/7/20 END: 12/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151576, -81.633234

EXPLORATION ID B-071-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1003.7	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
10.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	1002.3																		
SOFT TO VERY STIFF, BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, DAMP	999.2	1	6 4 2	8	44	SS-1	2.50	-	-	-	-	-	-	-	-	17	A-4a (V)	<100	
		2	2 2 3	7	39	SS-2	0.25	17	17	16	34	16	26	18	8	18	A-4a (3)	-	
LOOSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY**, MOIST	996.2	3	3 4 3	10	56	SS-3	-	-	-	-	-	-	-	-	-	14	A-2-6 (V)	-	
		4	2 2 3	7	44	SS-4	-	-	-	-	-	-	-	-	-	15	A-2-6 (V)	-	
		5																	
		6																	
		7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / JL	DRILL RIG: CME 55T	STATION / OFFSET: 12+26, 52' LT.
TYPE: LIGHT TOWER	SAMPLING FIRM / LOGGER: NEAS / JL	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP R
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1000.1 (MSL) EOB: 26.5 ft.
START: 9/22/21 END: 9/22/21	SAMPLING METHOD: SPT	ENERGY RATIO (%): 68.4	LAT / LONG: 41.151369, -81.632552

EXPLORATION ID B-071-1-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1000.1	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
6.0" TOPSOIL (DRILLERS DESCRIPTION)	999.6																		
LOOSE, BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, DAMP		1																	
		2																	
		3	4 5 4	10	100	SS-1	-	27	22	17	22	12	31	20	11	11	A-2-6 (0)	-	
		4																	
		5	2 4 3	8	33	SS-2	-	-	-	-	-	-	-	-	-	14	A-2-6 (V)	-	
	993.1	6																	
LOOSE TO MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, CONTAINS IRON STAINING, CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP		7																	
		8	2 3 3	7	22	SS-3	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	-	
		9																	
		10	2 4 7	13	56	SS-4	-	46	23	8	16	7	27	18	9	12	A-2-4 (0)	-	
	988.1	11																	
VERY LOOSE TO MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP		12																	
		13	3 3 2	6	44	SS-5	-	-	-	-	-	-	-	-	-	9	A-1-b (V)	-	
		14																	
		15	2 2 1	3	50	SS-6	-	16	49	26	8	1	NP	NP	NP	9	A-1-b (0)	-	
		16																	
		17	2 3 4	8	89	SS-7	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
		18																	
		19	7 6 6	14	67	SS-8	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	-	
		20																	
		21	6 7 8	17	56	SS-9	-	-	-	-	-	-	-	-	-	7	A-1-b (V)	-	
		22																	
		23	8 7 8	17	78	SS-10	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
	973.6	24																	
	EOB	25																	
		26																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 17+63, 9' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP R
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1006.1 (MSL) EOB: 7.5 ft.
START: 12/7/20 END: 12/7/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.151475, -81.632363

EXPLORATION ID B-072-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1006.1	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
9.0" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1004.8	1																	
MEDIUM DENSE TO VERY DENSE, BROWN AND BLACK, **GRAVEL AND STONE FRAGMENTS WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS ASPHALT FRAGMENTS, MOIST TO WET **(FILL)**	1001.6	2	10 23 22	61	100	SS-1	-	46	21	14	15	4	NP	NP	NP	11	A-1-b (0)	280	
		3	7 5 6	15	44	SS-2	-	-	-	-	-	-	-	-	-	18	A-1-b (V)	-	
HARD, BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, DAMP		4	5 7 12	26	100	SS-3	4.50	14	19	21	29	17	23	14	9	12	A-4a (2)	-	
	998.6	5	4 5 9	19	100	SS-4	4.50	-	-	-	-	-	-	-	-	10	A-4a (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 116+93, 1' RT.	EXPLORATION ID B-073-0-20
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1000.2 (MSL) EOB: 26.5 ft.	PAGE 1 OF 1
START: 10/13/20 END: 10/13/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.148544, -81.633523	

MATERIAL DESCRIPTION AND NOTES	ELEV. 1000.2	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	999.1																		
VERY STIFF TO HARD, GRAY AND BROWN, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, DAMP TO MOIST			3 4 6	14	67	SS-1	4.50	10	22	20	28	20	26	16	10	14	A-4a (3)	-	
			2 3 5	11	78	SS-2	2.50	-	-	-	-	-	-	-	-	22	A-4a (V)	-	
	990.7		4 3 6	12	89	SS-3	3.00	9	21	25	27	18	28	18	10	21	A-4a (2)	-	
VERY STIFF, BROWN WITH BLACK AND GRAY, **SILT AND CLAY**, "AND" SAND, LITTLE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP TO MOIST			3 3 3	8	56	SS-4	2.75	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	985.7	W 986.2	4 3 4	10	67	SS-5	2.25	16	25	18	27	14	30	18	12	20	A-6a (2)	-	
LOOSE TO MEDIUM DENSE, BROWNISH GRAY BECOMING GRAY, **COARSE AND FINE SAND**, SOME SILT, TRACE TO LITTLE GRAVEL, TRACE CLAY, WET @15.0' TO 16.5'; SS-6 CONTAINS NO RECOVERY			4 4 6	14	0	SS-6	-	-	-	-	-	-	-	-	-	-		-	
			4 4 6	14	56	SS-7	-	-	-	-	-	-	-	-	-	18	A-3a (V)	-	
			3 4 3	10	94	SS-8	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
			5 4 6	14	72	SS-9	-	-	-	-	-	-	-	-	-	20	A-3a (V)	-	
	973.7	EOB	6 5 5	14	89	SS-10	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 14.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 1 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 1/28/21 10:27 - X:\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\SUM-77-24.12 GHENT\GINT FILES\SUM-77-24.12.GPJ

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 118+92, 0' LT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 998.0 (MSL) EOB: 26.5 ft.
START: 10/13/20 END: 10/13/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.148826, -81.632906

EXPLORATION ID B-074-0-20

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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	998.0																		
LOOSE, BROWN, **COARSE AND FINE SAND**, LITTLE GRAVEL, LITTLE SILT, TRACE CLAY, DAMP	996.9		6 4 3	10	39	SS-1	-	-	-	-	-	-	-	-	-	8	A-3a (V)	127	
VERY STIFF, BROWN AND ORANGISH BROWN, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, CONTAINS TRACE IRON STAINING, DAMP	995.0		5 4 5	12	50	SS-2	3.00	20	18	22	25	15	22	15	7	12	A-4a (1)	-	
VERY STIFF, BROWN MOTTLED WITH ORANGISH BROWN AND BLACK, **SILTY CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, SLIGHTLY ORGANIC, MOIST	993.5		2 2 4	8	67	SS-3	2.75	8	13	17	41	21	40	24	16	30	A-6b (8)	-	
MEDIUM STIFF TO STIFF, BROWN AND ORANGISH BROWN, **SANDY SILT**, TRACE TO SOME GRAVEL, TRACE TO LITTLE CLAY, DAMP TO MOIST	992.0		3 4 3	10	78	SS-4	1.00	-	-	-	-	-	-	-	-	23	A-4a (V)	-	
			3 4 6	14	61	SS-5	0.75	-	-	-	-	-	-	-	-	18	A-4a (V)	-	
@10.0' - 14.0'; SS-6 AND SS-7 BECOME HARD			3 4 4	11	78	SS-6	4.50	25	12	13	36	14	25	18	7	16	A-4a (3)	-	
		W 984.0	4 3 4	10	56	SS-7	4.50	-	-	-	-	-	-	-	-	19	A-4a (V)	-	
LOOSE, BROWN AND ORANGISH BROWN, **SANDY SILT**, TRACE CLAY, TRACE GRAVEL, WET	983.0		3 3 3	8	50	SS-8	-	-	-	-	-	-	-	-	-	19	A-4a (V)	-	
			2 3 4	10	56	SS-9	-	6	16	39	29	10	NP	NP	NP	19	A-4a (1)	-	
LOOSE TO MEDIUM DENSE, GRAY, **SILT**, SOME SAND, TRACE TO LITTLE CLAY, TRACE GRAVEL, WET	978.5		5 5 8	18	83	SS-10	-	-	-	-	-	-	-	-	-	27	A-4b (V)	-	
			4 4 3	10	89	SS-11	-	-	-	-	-	-	-	-	-	23	A-4b (V)	-	
	971.5	EOB	5 3 5	11	100	SS-12	-	0	0	21	75	4	NP	NP	NP	26	A-4b (8)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 14.0' DURING DRILLING. HOLE CAVED-IN AT 4.0'.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 11/17/21 13:32 - X:\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\SUM-77-24.12 GHENT\GINT FILES\SUM-77-24.12.GPJ

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 120+95, 15' RT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 996.4 (MSL) EOB: 26.5 ft.
START: 10/14/20 END: 10/14/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149047, -81.632227

EXPLORATION ID B-075-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 996.4	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
6.0" ASPHALT AND 10.0" BASE (DRILLERS DESCRIPTION)	995.1	1																	
VERY SOFT, BROWN MOTTLED WITH GRAY AND ORANGISH BROWN, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, CONTAINS IRON STAINING, WET	992.4	2	8 5 7	16	56	SS-1	0.25	24	14	16	32	14	26	17	9	25	A-4a (2)	313	
LOOSE TO MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND, SILT, AND CLAY**, CONTAINS IRON STAINING, MOIST	986.1	5	6 6 5	15	67	SS-2	-	-	-	-	-	-	-	-	-	17	A-2-6 (V)	-	
		8	3 3 3	8	78	SS-3	-	13	29	23	21	14	26	15	11	15	A-2-6 (0)	-	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, LITTLE SILT, TRACE CLAY, DAMP TO MOIST	983.1	10	4 3 4	10	61	SS-4A	-	-	-	-	-	-	-	-	-	16	A-2-6 (V)	-	
						SS-4B	-	-	-	-	-	-	-	-	-	13	A-3a (V)	-	
		13	4 7 7	19	67	SS-5A	-	-	-	-	-	-	-	-	-	15	A-3a (V)	-	
						SS-5B	4.50	-	-	-	-	-	-	-	-	17	A-4b (V)	-	
HARD, GRAY, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, DAMP		15	6 8 11	26	100	SS-6	4.50	1	0	3	69	27	24	20	4	18	A-4b (8)	-	
		18	4 5 7	16	89	SS-7	4.50	-	-	-	-	-	-	-	-	17	A-4b (V)	-	
		20	5 6 8	19	78	SS-8	4.50	-	-	-	-	-	-	-	-	17	A-4b (V)	-	
		23	4 7 10	23	67	SS-9	4.50	1	1	5	67	26	25	18	7	16	A-4b (8)	-	
	969.9	25	5 8 12	27	89	SS-10	4.50	-	-	-	-	-	-	-	-	17	A-4b (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 122+95, 25' RT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 998.8 (MSL) EOB: 26.5 ft.
START: 10/14/20 END: 10/14/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149214, -81.631546

EXPLORATION ID B-076-0-20

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
10.0" BASE/ASPHALT MILLINGS (DRILLERS DESCRIPTION)	998.0																		
HARD, BROWN, **SANDY SILT**, LITTLE GRAVEL, TRACE CLAY, CONTAINS IRON STAINING, DAMP	995.8		6 6 5	15	50	SS-1	4.50	19	18	25	28	10	20	16	4	10	A-4a (1)	100	
MEDIUM DENSE, BROWN, **SANDY SILT**, TRACE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP TO WET	989.3		5 4 5	12	72	SS-2	-	7	4	41	41	7	NP	NP	NP	13	A-4a (3)	-	
			3 3 5	11	83	SS-3	-	-	-	-	-	-	-	-	-	13	A-4a (V)	-	
			4 4 4	11	89	SS-4	-	-	-	-	-	-	-	-	-	9	A-4a (V)	-	
			4 6 7	18	78	SS-5	-	-	-	-	-	-	-	-	-	25	A-4a (V)	-	
STIFF, BROWN, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, WET	986.8		5 7 7	19	100	SS-6	1.75	0	0	1	68	31	31	26	5	32	A-4b (8)	-	
LOOSE TO MEDIUM DENSE, BROWN BECOMING GRAY, **COARSE AND FINE SAND**, LITTLE TO SOME SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS INTERBEDDED SILT LAYERS, CONTAINS IRON STAINING, MOIST TO WET			4 6 7	18	100	SS-7	-	-	-	-	-	-	-	-	-	19	A-3a (V)	-	
		W 984.3	4 3 4	10	89	SS-8	-	-	-	-	-	-	-	-	-	30	A-3a (V)	-	
			4 4 5	12	67	SS-9	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	
			3 3 3	8	78	SS-10	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	
			3 5 4	12	83	SS-11	-	-	-	-	-	-	-	-	-	25	A-3a (V)	-	
	972.3	EOB	5 3 5	11	67	SS-12	-	-	-	-	-	-	-	-	-	22	A-3a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 14.5' DURING DRILLING, 16.0' AFTER COMPLETION. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 124+91, 12' RT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1003.3 (MSL) EOB: 26.5 ft.
START: 10/14/20 END: 10/14/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149418, -81.630881

EXPLORATION ID B-077-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1003.3	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
8.0" ASPHALT MILLINGS AND GRAVEL (DRILLERS DESCRIPTION)	1002.6																		
MEDIUM DENSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP			6 7 4	15	67	SS-1	-	29	24	18	20	9	25	18	7	11	A-2-4 (0)	-	
	997.5		4 6 7	18	78	SS-2A	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	-	
VERY STIFF, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST	996.3					SS-2B	3.00	-	-	-	-	-	-	-	-	20	A-6a (V)	-	
HARD, BROWN, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, MOIST	993.8		6 8 7	20	100	SS-3	4.50	0	5	9	58	28	28	20	8	22	A-4b (8)	-	
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, MOIST TO DAMP	990.2		6 10 12	30	94	SS-4	3.00	1	6	9	45	39	33	19	14	21	A-6a (10)	-	
			7 7 14	29	100	SS-5A	4.50	-	-	-	-	-	-	-	-	15	A-6a (V)	-	
						SS-5B	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, TRACE TO LITTLE SILT, TRACE CLAY, DAMP TO WET	983.8	W 985.1	6 9 7	22	72	SS-6	-	-	-	-	-	-	-	-	-	6	A-3a (V)	-	
			4 4 6	14	72	SS-7	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
MEDIUM DENSE, ORANGISH BROWN AND GRAY, **FINE SAND**, LITTLE COARSE SAND, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS IRON STAINING, WET	978.8		5 6 5	15	100	SS-8	-	-	-	-	-	-	-	-	-	28	A-3 (V)	-	
			6 7 9	22	78	SS-9	-	-	-	-	-	-	-	-	-	22	A-3 (V)	-	
MEDIUM DENSE, GRAY, **SILT**, SOME SAND, LITTLE CLAY, TRACE GRAVEL, WET	976.8	EOB	6 7 11	25	100	SS-10	-	0	0	21	67	12	NP	NP	NP	24	A-4b (8)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 18.2' DURING DRILLING, 19.2' AFTER COMPLETION. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 1 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 126+90, 5' RT.
TYPE: NOISE WALL	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP L
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1007.6 (MSL) EOB: 26.5 ft.
START: 10/14/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149662, -81.630231

EXPLORATION ID B-078-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1007.6	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
10.0" BASE/ASPHALT MILLINGS (DRILLERS DESCRIPTION)	1006.8																		
HARD, BROWN, **SILT AND CLAY**, TRACE TO LITTLE SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP		1	4 6 7	18	78	SS-1	4.50	10	3	5	45	37	35	20	15	19	A-6a (10)	<100	
		2																	
		3	5 5 8	18	100	SS-2	4.50	9	7	8	45	31	32	20	12	17	A-6a (9)	-	
		4																	
	1001.6	5	6 8 10	25	78	SS-3	4.50	-	-	-	-	-	-	-	-	19	A-6a (V)	-	
VERY STIFF TO HARD, BROWN, **SILTY CLAY**, TRACE SAND, TRACE GRAVEL, MOIST		6	7 7 12	26	83	SS-4	4.50	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
		7	6 7 11	25	67	SS-5	4.50	0	3	5	49	43	35	19	16	20	A-6b (10)	-	
		8																	
		9																	
		10	5 8 10	25	56	SS-6	3.50	-	-	-	-	-	-	-	-	20	A-6b (V)	-	
	995.6	11																	
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, DAMP TO MOIST		12																	
		13	7 9 11	27	89	SS-7	4.00	0	2	4	48	46	36	22	14	21	A-6a (10)	-	
		14																	
	992.1	15	4 4 6	14	67	SS-8A	4.25	-	-	-	-	-	-	-	-	23	A-6a (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE TO SOME SILT, TRACE TO LITTLE GRAVEL, TRACE CLAY, CONTAINS IRON STAINING, DAMP		16				SS-8B	-	-	-	-	-	-	-	-	-	9	A-3a (V)	-	
		17																	
		18	5 7 7	19	61	SS-9	-	-	-	-	-	-	-	-	-	7	A-3a (V)	-	
		19																	
		20	4 4 7	15	61	SS-10	-	-	-	-	-	-	-	-	-	7	A-3a (V)	-	
		21																	
		22																	
		23	5 6 9	20	78	SS-11	-	-	-	-	-	-	-	-	-	5	A-3a (V)	-	
		24																	
		25																	
	981.1	26	4 6 7	18	83	SS-12	-	-	-	-	-	-	-	-	-	14	A-3a (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 85+42, 13' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: GHENT ROAD
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 999.3 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149211, -81.628380

EXPLORATION ID B-079-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 999.3	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	998.2																		
HARD, BROWN, **SANDY SILT**, SOME CLAY, LITTLE GRAVEL, DAMP	996.3		7 6 4	14	67	SS-1	4.50	14	6	20	38	22	25	16	9	12	A-4a (5)	310	
VERY STIFF, BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST			5 4 5	12	78	SS-2	4.00	2	9	15	43	31	29	18	11	19	A-6a (8)	-	
			3 3 4	10	72	SS-3	3.00	-	-	-	-	-	-	-	-	23	A-6a (V)	-	
	991.8	EOB	4 5 6	15	94	SS-4	2.50	-	-	-	-	-	-	-	-	21	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 127+44, 73' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP M
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1002.8 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.149991, -81.629003

EXPLORATION ID B-080-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1002.8	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	1001.7																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME GRAVEL, TRACE SILT, TRACE CLAY, DAMP **(FILL)**	999.8		4 5 5	14	44	SS-1	-	-	-	-	-	-	-	-	-	3	A-3a (V)	<100	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS BRICK FRAGMENTS, DAMP **(FILL)**	998.3		5 9 6	20	56	SS-2	-	40	19	19	16	6	NP	NP	NP	6	A-1-b (0)	-	
MEDIUM DENSE, BROWN, **SANDY SILT**, TRACE CLAY, TRACE GRAVEL, DAMP	995.3	EOB	6 6 8	19	56	SS-3	-	8	24	30	28	10	NP	NP	NP	11	A-4a (1)	-	
			6 8 5	18	72	SS-4	-	-	-	-	-	-	-	-	-	11	A-4a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 27+99, 26' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP N
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1010.5 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.150109, -81.629687

EXPLORATION ID B-081-0-20

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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	1010.5																		
	1009.4	1																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE SILT, LITTLE CLAY, LITTLE GRAVEL, CONTAINS ROOTS, DAMP		2	4 6 6	16	44	SS-1	-	-	-	-	-	-	-	-	-	10	A-3a (V)	<100	
	1007.5	3																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, DAMP		4	4 5 7	16	56	SS-2	-	24	23	20	23	10	NP	NP	NP	8	A-2-4 (0)	-	
	1006.0																		
HARD, BROWN, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, DAMP TO MOIST		5	4 6 7	18	67	SS-3	4.50	2	4	7	49	38	35	20	15	19	A-6a (10)	-	
		6	4 7 7	19	67	SS-4	4.50	-	-	-	-	-	-	-	-	21	A-6a (V)	-	
	1003.0	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 32+00, 35' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP N
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 992.2 (MSL) EOB: 7.5 ft.
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.151087, -81.629011

EXPLORATION ID B-082-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 992.2	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	991.1																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, TRACE SILT, TRACE CLAY, DAMP		1	4 6 8	19	61	SS-1	-	32	26	29	10	3	NP	NP	NP	5	A-1-b (0)	130	
		2	5 5 6	15	61	SS-2	-	29	27	35	7	2	NP	NP	NP	6	A-1-b (0)	-	
		3	4 6 9	20	100	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	-	
		4	5 6 8	19	100	SS-4	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
	984.7	5																	
		6																	
		7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 336+08, 58' RT.	EXPLORATION ID B-083-0-20
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB	
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 975.5 (MSL) EOB: 7.5 ft.	PAGE 1 OF 1
START: 10/15/20 END: 10/15/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.152081, -81.628359	

MATERIAL DESCRIPTION AND NOTES	ELEV. 975.5	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
6.0" ASPHALT AND 7.0" BASE (DRILLERS DESCRIPTION)	974.4																		
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **SANDY SILT**, LITTLE GRAVEL, TRACE CLAY, CONTAINS IRON STAINING, DAMP @1.5'; SS-1 NO RECOVERY		1	5 9 10	26	0	SS-1	-	-	-	-	-	-	-	-	-	-		-	
		2																	
		3	4 5 8	18	67	SS-2	-	17	15	32	28	8	NP	NP	NP	11	A-4a (0)	-	
	971.0	4																	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, DAMP		5	5 8 7	20	72	SS-3	-	29	19	17	24	11	23	16	7	10	A-2-4 (0)	-	
		6	6 7 11	25	89	SS-4	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	-	
	968.0	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12
TYPE: SUBGRADE
PID: 111404 SFN:
START: 12/10/20 END: 12/10/20

DRILLING FIRM / OPERATOR: NEAS / J. HODGES
SAMPLING FIRM / LOGGER: NEAS / J. HODGES
DRILLING METHOD: 3.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: CME 55X
HAMMER: CME AUTOMATIC
CALIBRATION DATE: 12/5/19
ENERGY RATIO (%): 81.9

STATION / OFFSET: 786+82, 97' LT.
ALIGNMENT: IR-77
ELEVATION: 1170.5 (MSL) EOB: 7.5 ft.
LAT / LONG: 41.193063, -81.625949

EXPLORATION ID B-084-0-20

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
6.0" ASPHALT (DRILLERS DESCRIPTION)	1170.5																		
VERY STIFF, BROWN MOTTLED WITH GRAY AND ORANGISH BROWN, **SILT AND CLAY**, LITTLE TO SOME SAND, LITTLE TO SOME GRAVEL, CONTAINS IRON STAINING, DAMP TO MOIST	1170.0	1	9 7 7	19	100	SS-1	3.00	12	8	11	36	33	32	18	14	17	A-6a (8)	<100	
		2																	
		3	3 2 5	10	44	SS-2	3.75	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
		4																	
		5	6 8 7	20	39	SS-3	3.50	21	8	13	39	19	30	19	11	17	A-6a (5)	-	
		6																	
	1163.0	7 EOB	5 5 7	16	56	SS-4	3.00	-	-	-	-	-	-	-	-	20	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 23+06, 14' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP D
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1160.1 (MSL) EOB: 7.5 ft.
START: 12/10/20 END: 12/10/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.194777, -81.626030

EXPLORATION ID B-085-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1160.1	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
11.0" ASPHALT (DRILLERS DESCRIPTION)	1159.2																		
VERY STIFF TO HARD, BROWN MOTTLED WITH ORANGISH BROWN, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, CONTAINS IRON STAINING, DAMP	1155.6	1 2 3 4	6 6 7	18	56	SS-1	3.00	-	-	-	-	-	-	-	-	12	A-6a (V)	<100	
			5 4 3	10	72	SS-2	4.50	10	10	18	36	26	28	16	12	14	A-6a (6)	-	
MEDIUM STIFF TO VERY STIFF, DARK BROWNISH GRAY AND BLACK, **ELASTIC CLAY**, "AND" SILT, TRACE SAND, TRACE GRAVEL, MODERATELY ORGANIC, DAMP	1152.6	5 6	4 3 5	11	89	SS-3	0.75	1	2	7	42	48	69	34	35	17	A-7-5 (20)	-	
		EOB 7	2 4 3	10	100	SS-4	2.50	-	-	-	-	-	-	-	-	23	A-7-5 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 99+01, 13' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP C
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1154.7 (MSL) EOB: 7.5 ft.
START: 12/18/20 END: 12/18/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.196421, -81.626164

EXPLORATION ID B-086-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1154.7	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
9.0" ASPHALT (DRILLERS DESCRIPTION)	1153.9																		
STIFF TO VERY STIFF, BROWN WITH ORANGISH BROWN MOTTLES, **SANDY SILT**, LITTLE GRAVEL, LITTLE CLAY, CONTAINS IRON STAINING, DAMP		1 2 3 4	5 11 6	23	44	SS-1	3.75	20	21	23	24	12	23	14	9	11	A-4a (0)	-	
	1150.2		4 2 4	8	22	SS-2	1.50	-	-	-	-	-	-	-	-	13	A-4a (V)	<100	
MEDIUM STIFF TO STIFF, DARK BROWNISH GRAY AND BLACK, **CLAY**, SOME SILT, SOME SAND, TRACE GRAVEL, SLIGHTLY ORGANIC, MOIST		5 6	2 2 2	5	100	SS-3	1.00	9	14	19	35	23	46	23	23	30	A-7-6 (10)	-	
	1147.2	7 EOB	3 2 3	7	100	SS-4	0.75	-	-	-	-	-	-	-	-	33	A-7-6 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 103+04, 16' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP C
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1158.4 (MSL) EOB: 7.5 ft.
START: 12/22/20 END: 12/22/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.197515, -81.626021

EXPLORATION ID B-087-0-20

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MATERIAL DESCRIPTION AND NOTES	ELEV. 1158.4	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
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, WET	1155.3	1	6 4 4	11	67	SS-1	-	26	32	26	13	3	NP	NP	NP	18	A-1-b (0)	1200	
HARD, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE GRAVEL, DAMP		2	5 7 8	20	100	SS-2	4.50	14	13	16	30	27	27	16	11	12	A-6a (5)	-	
		3	7 7 8	20	22	SS-3	4.25	-	-	-	-	-	-	-	-	16	A-6a (V)	-	
	1150.9	4	8 9 6	20	33	SS-4	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
		EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 107+16, 1' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP C
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1161.3 (MSL) EOB: 7.5 ft.
START: 10/21/20 END: 10/21/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.198644, -81.625927

EXPLORATION ID B-088-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1161.3	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
5.0" ASPHALT AND 8.0" BASE (DRILLERS DESCRIPTION)	1160.2	1																	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, LITTLE TO SOME SILT, LITTLE GRAVEL, TRACE CLAY, DAMP		2	4 6 5	15	56	SS-1	-	20	24	26	21	9	NP	NP	NP	9	A-3a (0)	<100	
	1156.8	3	5 5 7	16	67	SS-2	-	17	27	36	14	6	NP	NP	NP	7	A-3a (0)	-	
LOOSE, BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP TO MOIST		4	4 3 3	8	50	SS-3	-	9	27	29	24	11	20	13	7	13	A-2-4 (0)	-	
	1153.8	5	5 3 4	10	44	SS-4	-	-	-	-	-	-	-	-	-	18	A-2-4 (V)	-	
		EOB 6																	
		7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 88+52, 17' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP A
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1162.0 (MSL) EOB: 7.5 ft.
START: 10/20/20 END: 10/20/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.193517, -81.625070

EXPLORATION ID B-089-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1162.0	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
8.5" ASPHALT AND 6.0" BASE (DRILLERS DESCRIPTION)	1160.8	1																	
HARD, BROWN, **SILT AND CLAY**, LITTLE TO SOME GRAVEL, LITTLE TO SOME SAND, DAMP @1.5' TO 3.0'; SS-1 CONTAINS NO RECOVERY		2	5 6 10	22	0	SS-1	-	-	-	-	-	-	-	-	-	-		-	
		3	6 8 11	26	78	SS-2	4.50	23	12	9	29	27	32	17	15	11	A-6a (6)	110	
		4	7 10 11	29	67	SS-3	4.50	13	9	8	36	34	33	20	13	14	A-6a (8)	-	
		5																	
		6	8 10 14	33	72	SS-4	4.50	-	-	-	-	-	-	-	-	12	A-6a (V)	-	
	1154.5	7 EOB																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 7+13, 9' LT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: RAMP B
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1159.2 (MSL) EOB: 7.5 ft.
START: 10/20/20 END: 10/20/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.195890, -81.625231

EXPLORATION ID B-090-0-20

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
5.0" ASPHALT AND 10.5" CONCRETE (DRILLERS DESCRIPTION)	1159.2 1157.9																		
HARD, BROWN AND GRAY, **SANDY SILT**, SOME GRAVEL, LITTLE CLAY, DAMP	1154.7		4 6 7	18	50	SS-1	4.50	23	11	22	30	14	21	16	5	11	A-4a (2)	-	
			3 3 4	10	56	SS-2	4.50	-	-	-	-	-	-	-	-	13	A-4a (V)	170	
MEDIUM STIFF TO VERY STIFF, BROWNISH GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, MOIST TO WET			4 4 6	14	83	SS-3	2.25	7	9	17	35	32	32	18	14	19	A-6a (8)	-	
	1151.7	EOB	4 5 7	16	89	SS-4	1.00	-	-	-	-	-	-	-	-	31	A-6a (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / ASHBAUGH	DRILL RIG: CME 45B	STATION / OFFSET: 804+00, 92' RT.
TYPE: SUBGRADE	SAMPLING FIRM / LOGGER: NEAS / ASHBAUGH	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1159.8 (MSL) EOB: 7.5 ft.
START: 10/21/20 END: 10/21/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.7	LAT / LONG: 41.197778, -81.625279

EXPLORATION ID B-091-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1159.8	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
11.0" BASE/ASPHALT MILLINGS (DRILLERS DESCRIPTION)	1158.9																		
MEDIUM DENSE, BROWN AND BLACK, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS ASPHALT FRAGMENTS, DAMP TO MOIST **(FILL)**		1	7 4 5	12	56	SS-1	-	27	24	22	18	9	NP	NP	NP	12	A-2-4 (0)	170	
	1155.3	2	6 6 4	14	72	SS-2	-	-	-	-	-	-	-	-	-	17	A-2-4 (V)	-	
STIFF TO VERY STIFF, BROWN AND GRAY, **SILT AND CLAY**, SOME SAND, TRACE GRAVEL, DAMP TO MOIST		3	3 3 6	12	50	SS-3	3.25	20	13	13	31	23	32	18	14	15	A-6a (5)	-	
	1152.3	4	4 3 4	10	50	SS-4	2.00	-	-	-	-	-	-	-	-	23	A-6a (V)	-	
		EOB 7																	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED 0.5 BAG ASPHALT PATCH; SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 413+49, 12' RT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1014.1 (MSL) EOB: 26.5 ft.
START: 8/27/20 END: 8/27/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148552, -81.635118

EXPLORATION ID B-092-0-20

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
HARD, BROWN AND GRAY, **SANDY SILT**, SOME CLAY, LITTLE GRAVEL, CONTAINS TRACE IRON STAINING AND ROOT HAIRS, DAMP	1014.1																		
	1009.6	3	3 3 3	8	56	SS-1	4.50	11	11	16	37	25	30	20	10	15	A-4a (5)	310	
HARD, BROWN AND GRAY, **SILT AND CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	1007.1	5	3 5 7	16	100	SS-2	4.50	5	5	6	43	41	34	19	15	18	A-6a (10)	-	
VERY STIFF TO HARD, BROWN MOTTLED WITH GRAY, **SILT**, SOME CLAY, LITTLE SAND, TRACE GRAVEL, DAMP	999.6	10	2 4 7	15	100	SS-3	4.50	-	-	-	-	-	-	-	-	19	A-4b (V)	-	
		15	5 8 8	22	100	SS-4	4.50	6	6	12	53	23	28	19	9	15	A-4b (8)	-	
		20	3 4 5	12	100	SS-5	2.75	-	-	-	-	-	-	-	-	18	A-4b (V)	-	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, SOME SILT, SOME GRAVEL, LITTLE CLAY, CONTAINS TRACE IRON STAINING, DAMP	997.1	25	6 9 9	25	100	SS-6	-	-	-	-	-	-	-	-	-	13	A-3a (V)	-	
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, CONTAINS IRON STAINING, DAMP TO MOIST			5 7 10	23	100	SS-7	-	-	-	-	-	-	-	-	-	12	A-2-4 (V)	-	
@20.0'; SS-8 CONTAINS WOOD FRAGMENTS		30	5 5 5	14	100	SS-8	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	-	
@22.5'; SS-9 BECOMES BROWN AND BLACK, MODERATELY ORGANIC, CONTAINS LAMINATIONS OF PEAT		35	1 6 10	22	67	SS-9	-	-	-	-	-	-	-	-	-	14	A-2-4 (V)	-	
	987.6	EOB	2 4 11	20	56	SS-10	-	-	-	-	-	-	-	-	-	11	A-2-4 (V)	-	

NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 416+09, 22' RT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1011.3 (MSL) EOB: 26.5 ft.
START: 8/24/20 END: 8/24/20	SAMPLING METHOD: SPT / ST	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149053, -81.634450

EXPLORATION ID B-093-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1011.3	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
VERY STIFF TO HARD, BROWN, **SILT AND CLAY**, SOME SAND, LITTLE TO SOME GRAVEL, DAMP	1001.8		14 14 10	33	100	SS-1	4.50	15	16	17	32	20	32	18	14	14	A-6a (5)	<100	
			6 7 8	20	100	SS-2	4.50	-	-	-	-	-	-	-	-	13	A-6a (V)	-	
			3 3 4	10	67	SS-3	2.25	21	16	19	29	15	30	17	13	15	A-6a (3)	-	
STIFF TO VERY STIFF, GRAY AND BROWN, **SANDY SILT**, LITTLE CLAY, LITTLE GRAVEL, SLIGHTLY ORGANIC, DAMP		W 1001.3	2 2 3	7	100	SS-4	3.25	-	-	-	-	-	-	-	-	19	A-4a (V)	-	
@13.5' TO 13.8'; ST-1 LOI = 3.4%	996.8				83	ST-1	1.75	12	13	19	38	18	29	20	9	19	A-4a (4)	-	
VERY LOOSE, BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND AND SILT**, LITTLE CLAY, WET	994.8		2 1 2	4	78	SS-5	-	-	-	-	-	-	-	-	-	16	A-2-4 (V)	-	
MEDIUM STIFF TO STIFF, GRAY AND BLACK, **CLAY**, "AND" SILT, LITTLE SAND, LITTLE GRAVEL, MODERATELY ORGANIC, CONTAINS LAYERS OF BLACK PEAT, MOIST	991.8		1 2 6	11	56	SS-6	1.00	19	7	13	37	24	48	28	20	31	A-7-6 (10)	-	
VERY LOOSE, GRAYISH BROWN, **FINE SAND**, LITTLE COARSE SAND, TRACE SILT, TRACE CLAY, TRACE GRAVEL, WET	989.3		1 1 2	4	100	SS-7	-	-	-	-	-	-	-	-	-	31	A-3 (V)	-	
LOOSE TO MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, WET	984.8		1 2 5	10	100	SS-8	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	
		EOB	1 3 5	11	89	SS-9	-	-	-	-	-	-	-	-	-	28	A-3a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 10.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 1 BAG BENTONITE CHIPS; SHOVELED SOIL CUTTINGS

National Engineering & Architectural Services Inc.

5710 Westbourne Avenue
Columbus, OH 43213
614.892.0162

Consolidation Test

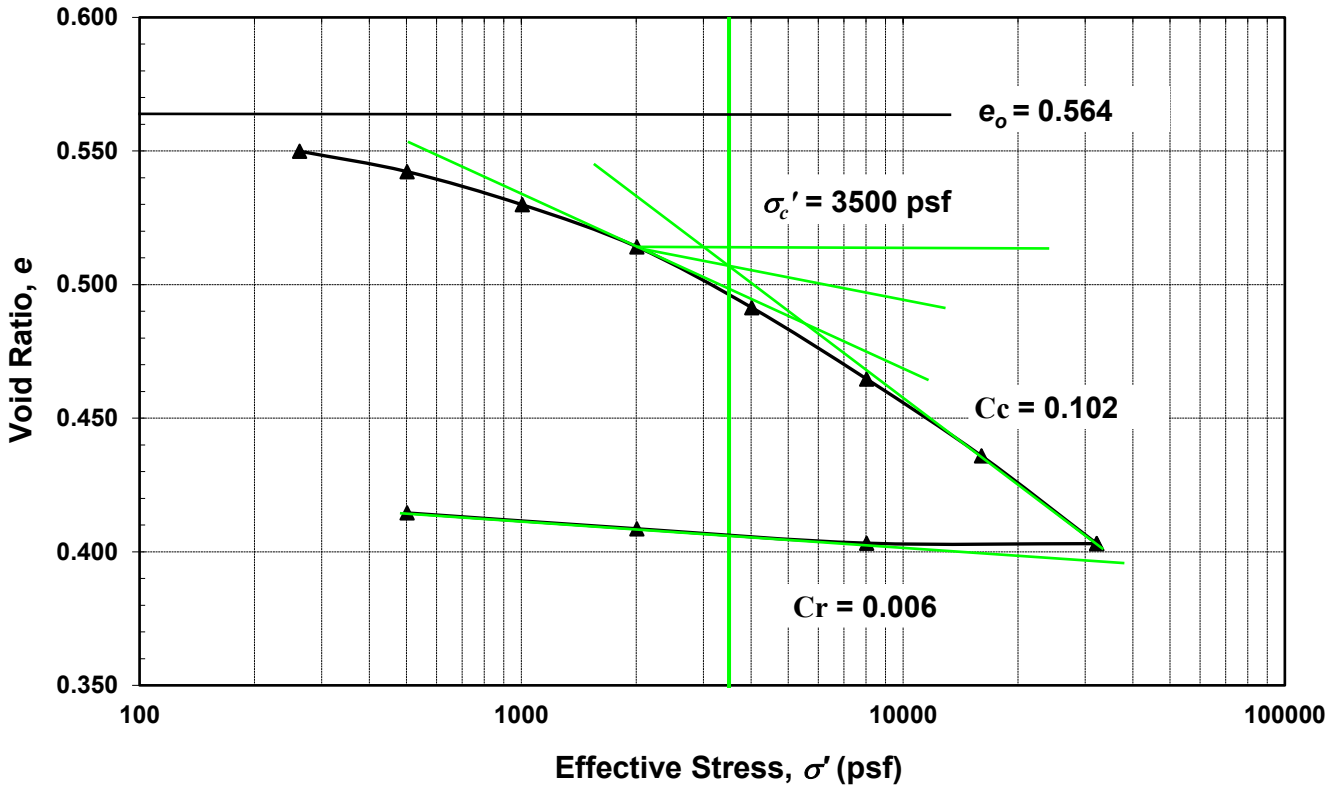
Project Name: SUM-77-24.12 | Prepared by: LR
Source: B-093-0-20 ST-1 (13.5' - 13.6') | Checked by: ZM
Description: Stiff, gray and brown, SANDY SILT, little clay, little gravel, damp. | Date: 1/16/2021

Test Specification: ASTM D 2435
Initial Void Ratio: 0.564 | Initial Bulk Unit Weight (lb/ft^3): 128
In-situ Vertical Effective Stress: 1600 | Dry Unit Weight (lb/ft^3): 108

Compression and Swelling Index

Compression Index (*Cc*): 0.102 | Preconsolidation Pressure (σ_c'): **3500**
Recompression Index (*Cr*): 0.006 | Over-Consolidation Ratio (*OCR*): **2.2**

Consolidation Curve



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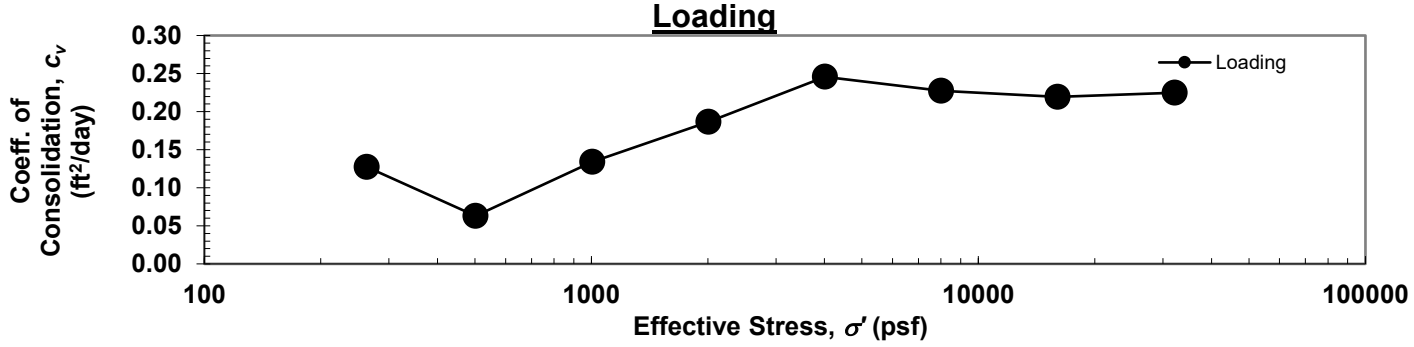


PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 417+86, 50' RT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 SB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1006.6 (MSL) EOB: 26.5 ft.
START: 8/25/20 END: 8/25/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.149331, -81.633922

EXPLORATION ID B-094-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1006.6	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
HARD, BROWN AND ORANGISH BROWN, **SILT AND CLAY**, SOME SAND, SOME GRAVEL, CONTAINS IRON STAINING, DAMP	1002.1		5 7 9	22	78	SS-1	4.50	25	13	17	27	18	33	18	15	13	A-6a (4)	<100	
HARD, BROWN, **SANDY SILT**, SOME CLAY, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP TO MOIST	997.1		3 3 5	11	100	SS-2	4.50	8	12	23	35	22	26	16	10	15	A-4a (4)	-	
			5 7 7	19	100	SS-3	4.50	-	-	-	-	-	-	-	-	17	A-4a (V)	-	
HARD, BROWN, **SILTY CLAY**, LITTLE SAND, TRACE GRAVEL, CONTAINS TRACE IRON STAINING, DAMP	994.6		5 7 5	16	100	SS-4	4.50	6	7	12	40	35	34	18	16	18	A-6b (10)	-	
LOOSE TO MEDIUM DENSE, ORANGISH BROWN, **COARSE AND FINE SAND**, LITTLE SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS HEAVY IRON STAINING, DAMP	987.1		5 4 5	12	100	SS-5	-	-	-	-	-	-	-	-	-	12	A-3a (V)	-	
			5 5 6	15	100	SS-6	-	-	-	-	-	-	-	-	-	8	A-3a (V)	-	
			3 2 2	5	89	SS-7	-	-	-	-	-	-	-	-	-	9	A-3a (V)	-	
LOOSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND AND SILT**, LITTLE CLAY, CONTAINS IRON STAINING, MOIST	984.6	W 986.6	1 2 2	5	67	SS-8	-	-	-	-	-	-	-	-	-	15	A-2-4 (V)	-	
LOOSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, WET	982.1		1 2 5	10	78	SS-9	-	-	-	-	-	-	-	-	-	22	A-1-b (V)	-	
MEDIUM DENSE, ORANGISH BROWN, **COARSE AND FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, CONTAINS HEAVY IRON STAINING, WET	980.1	EOB	2 5 6	15	67	SS-10	-	-	-	-	-	-	-	-	-	26	A-3a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 20.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 313+26, 16' LT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 1002.2 (MSL) EOB: 26.5 ft.
START: 8/27/20 END: 8/27/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148094, -81.634731

EXPLORATION ID B-095-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 1002.2	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
VERY STIFF TO HARD, BROWN AND DARK GRAY, **SILT AND CLAY**, SOME SAND, TRACE TO LITTLE GRAVEL, CONTAINS TRACE IRON STAINING, SS-1 IS MODERATELY ORGANIC, DAMP @2.5' TO 4.0'; SS-1 LOI = 4.1% @5.0'; SS-2 AND SS-3 BECOME BROWN AND GRAY	992.7		4 4 3	10	100	SS-1	3.50	16	14	18	34	18	35	23	12	20	A-6a (4)	1800	
			3 5 5	14	78	SS-2	4.50	-	-	-	-	-	-	-	-	18	A-6a (V)	-	
			3 4 4	11	100	SS-3	2.50	-	-	-	-	-	-	-	-	17	A-6a (V)	-	
MEDIUM STIFF TO VERY STIFF, DARK GRAY, **SANDY SILT**, LITTLE CLAY, TRACE GRAVEL, SS-4 IS MODERATELY ORGANIC, CONTAINS PEAT, MOIST @10.0' TO 11.5'; SS-4 LOI = 8.2% @12.5'; SS-5 BECOMES GRAY MOTTLED WITH ORANGISH BROWN, CONTAINS IRON STAINING	987.7		2 2 2	5	100	SS-4	2.50	-	-	-	-	-	-	-	-	28	A-4a (V)	-	
			1 1 3	5	100	SS-5	0.75	10	11	13	47	19	28	18	10	20	A-4a (6)	-	
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND**, LITTLE SILT, TRACE CLAY, CONTAINS IRON STAINING, WET	985.2	W 987.2	2 6 6	16	67	SS-6	-	-	-	-	-	-	-	-	-	26	A-1-b (V)	-	
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **COARSE AND FINE SAND**, LITTLE TO SOME GRAVEL, TRACE SILT, TRACE CLAY, CONTAINS IRON STAINING, WET	980.2		2 5 7	16	44	SS-7	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
			5 7 8	20	67	SS-8	-	-	-	-	-	-	-	-	-	23	A-3a (V)	-	
VERY STIFF, GRAY, **SILT AND CLAY**, TRACE SAND, TRACE GRAVEL, MOIST	977.7		2 3 5	11	100	SS-9	2.25	4	2	3	48	43	30	17	13	21	A-6a (9)	-	
STIFF, GRAY, **SILT**, SOME CLAY, TRACE SAND, TRACE GRAVEL, MOIST	975.7	EOB	6 7 10	23	100	SS-10	1.25	-	-	-	-	-	-	-	-	22	A-4b (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 15.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

National Engineering & Architectural Services Inc.
5710 Westbourne Avenue
Columbus, OH 43213
614.892.0162

Organic Content in Soils by Loss on Ignition (AASHTO T267)

Date of Test: 11/18/2021 Technician: LR

Project Name: SUM-77-24.12 Ghent

Boring Number:	B-095-0-20	B-095-0-20	B-093-0-20	B-006-1-20	
Sample Number:	SS-1	SS-4	ST-1	SS-1	
Depth:	2.5-4.0	10.0-11.5	13.5-13.8	2.5-4.0	
Initial -#10 sample weight:	104.91	103.26	102.52	101.01	

Moisture Content:

MC%:	20%	28%	19%	83% (org)	

Organic Content 455+-10°C (10 to 40g):

(Peat may be less than 10g but should be of sufficient amount to fill crucible >3/4 full)

Crucible ID:	A	C	B	C	
Crucible Wt:	62.3	60.85	33.94	37.77	
Crucible and Soil before:	98.98	98.12	57.76	53.6	
Crucible and Soil After:	97.48	95.06	56.95	51.01	
% Organic Content:	4.1%	8.2%	3.4%	16.4%	

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 316+24, 25' LT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 998.9 (MSL) EOB: 26.5 ft.
START: 8/26/20 END: 8/26/20	SAMPLING METHOD: SPT	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148583, -81.633866

EXPLORATION ID B-096-0-20

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
VERY STIFF, BROWN, **SANDY SILT**, LITTLE TO SOME GRAVEL, LITTLE CLAY, CONTAINS TRACE ROOTS AND IRON STAINING, DAMP	998.9																		
		1																	
		2																	
		3	6 4 4	11	11	SS-1	4.00	-	-	-	-	-	-	-	-	12	A-4a (V)	-	
		4																	
		5	3 3 3	8	100	SS-2	3.50	17	21	22	27	13	26	17	9	14	A-4a (1)	190	
		6																	
LOOSE, BROWN AND ORANGISH BROWN, **GRAVEL AND STONE FRAGMENTS WITH SAND, SILT, AND CLAY**, CONTAINS IRON STAINING, DAMP	991.9	7																	
		8	4 3 4	10	78	SS-3	-	-	-	-	-	-	-	-	-	13	A-2-6 (V)	-	
		9																	
SOFT, BROWN AND ORANGISH BROWN, **SILT AND CLAY**, "AND" SAND, SOME GRAVEL, CONTAINS IRON STAINING, DAMP	989.4	10	1 1 1	3	67	SS-4	0.25	23	21	17	26	13	29	18	11	18	A-6a (1)	-	
		11																	
	986.9	12																	
MEDIUM DENSE, BROWN AND ORANGISH BROWN, **GRAVEL WITH SAND**, LITTLE TO SOME SILT, LITTLE TO SOME CLAY, CONTAINS IRON STAINING, MOIST		W 986.4 13	4 6 6	16	89	SS-5	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	-	
		14																	
		15	5 6 9	20	17	SS-6	-	-	-	-	-	-	-	-	-	19	A-1-b (V)	-	
	981.9	16																	
MEDIUM DENSE, GRAY, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS TRACE IRON STAINING, DAMP TO MOIST		17																	
		18	6 10 6	22	44	SS-7	-	28	19	30	17	6	NP	NP	NP	13	A-2-4 (0)	-	
		19																	
		20	4 5 6	15	67	SS-8	-	-	-	-	-	-	-	-	-	18	A-2-4 (V)	-	
	976.9	21																	
MEDIUM DENSE, GRAY, **COARSE AND FINE SAND**, TRACE SILT, TRACE CLAY, TRACE GRAVEL, MOIST TO WET		22																	
		23	6 4 4	11	100	SS-9	-	-	-	-	-	-	-	-	-	16	A-3a (V)	-	
		24																	
		25																	
	972.4	26 EOB	4 4 4	11	100	SS-10	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 12.5' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

PROJECT: SUM-77-24.12	DRILLING FIRM / OPERATOR: NEAS / J. HODGES	DRILL RIG: CME 55X	STATION / OFFSET: 317+90, 59' LT.
TYPE: COMPRESSIBLE SOILS	SAMPLING FIRM / LOGGER: NEAS / J. HODGES	HAMMER: CME AUTOMATIC	ALIGNMENT: IR-77 NB
PID: 111404 SFN:	DRILLING METHOD: 3.25" HSA	CALIBRATION DATE: 12/5/19	ELEVATION: 993.6 (MSL) EOB: 26.5 ft.
START: 8/26/20 END: 8/26/20	SAMPLING METHOD: SPT / ST	ENERGY RATIO (%): 81.9	LAT / LONG: 41.148924, -81.633447

EXPLORATION ID B-097-0-20

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 993.6	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
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT**, TRACE CLAY, CONTAINS IRON STAINING, DAMP	989.1		6 8 9	23	100	SS-1	-	46	18	13	15	8	30	22	8	10	A-2-4 (0)	13	
VERY LOOSE TO MEDIUM DENSE, BROWN MOTTLED WITH GRAY AND ORANGISH BROWN BECOMING GRAY, **SILT**, TRACE TO SOME CLAY, TRACE TO LITTLE SAND, TRACE GRAVEL, DAMP TO WET @5.0' - 6.5'; CONTAINS IRON STAINING			4 6 12	25	67	SS-2	-	5	4	4	69	18	NP	NP	NP	24	A-4b (8)	-	
			3 4 7	15	56	SS-3	-	-	-	-	-	-	-	-	-	15	A-4b (V)	-	
					56	ST-1	-	1	3	11	64	21	NP	NP	NP	18	A-4b (8)	-	
		W 981.6	4 3 2	7	39	SS-4	-	-	-	-	-	-	-	-	-	25	A-4b (V)	-	
			2 2 2	5	100	SS-5	-	10	10	7	63	10	NP	NP	NP	23	A-4b (8)	-	
			1 1 1	3	100	SS-6	-	-	-	-	-	-	-	-	-	33	A-4b (V)	-	
			2 2 2	5	100	SS-7	-	-	-	-	-	-	-	-	-	29	A-4b (V)	-	
			1 2 2	5	100	SS-8	-	-	-	-	-	-	-	-	-	28	A-4b (V)	-	
	967.1	EOB	2 3 6	12	100	SS-9	-	-	-	-	-	-	-	-	-	25	A-4b (V)	-	

NOTES: GROUNDWATER ENCOUNTERED AT 12.0' DURING DRILLING. HOLE DID NOT CAVE.

ABANDONMENT METHODS, MATERIALS, QUANTITIES: SHOVELED SOIL CUTTINGS

National Engineering & Architectural Services Inc.

5710 Westbourne Avenue
Columbus, OH 43213
614.892.0162

Consolidation Test

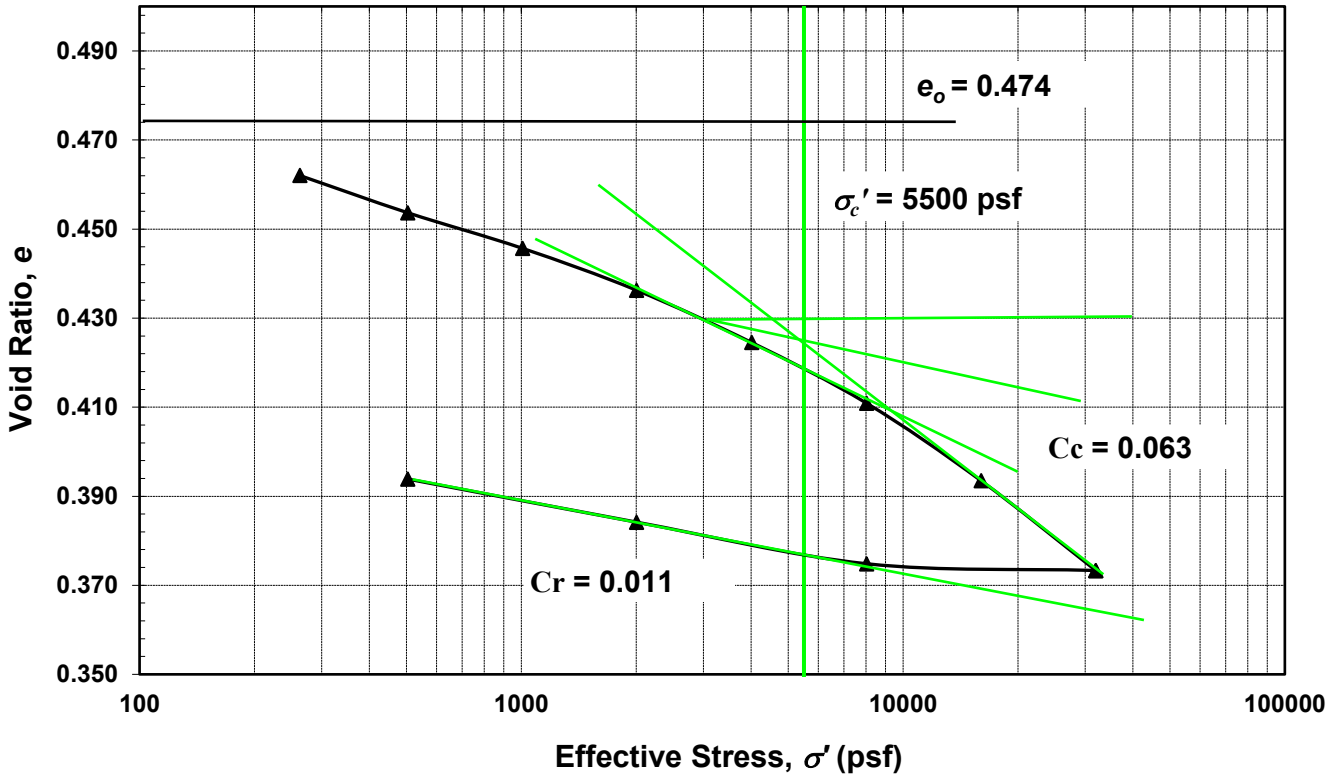
Project Name: SUM-77-24.12 | Prepared by: LR
Source: B-097-0-20 ST-1 (10.6' - 10.7') | Checked by: ZM
Description: Medium dense, gray, SILT, some clay, little sand, trace gravel, wet. | Date: 1/16/2021

Test Specification: ASTM D 2435
Initial Void Ratio: 0.474 | Initial Bulk Unit Weight (lb/ft^3): 137
In-situ Vertical Effective Stress: 1300 | Dry Unit Weight (lb/ft^3): 114

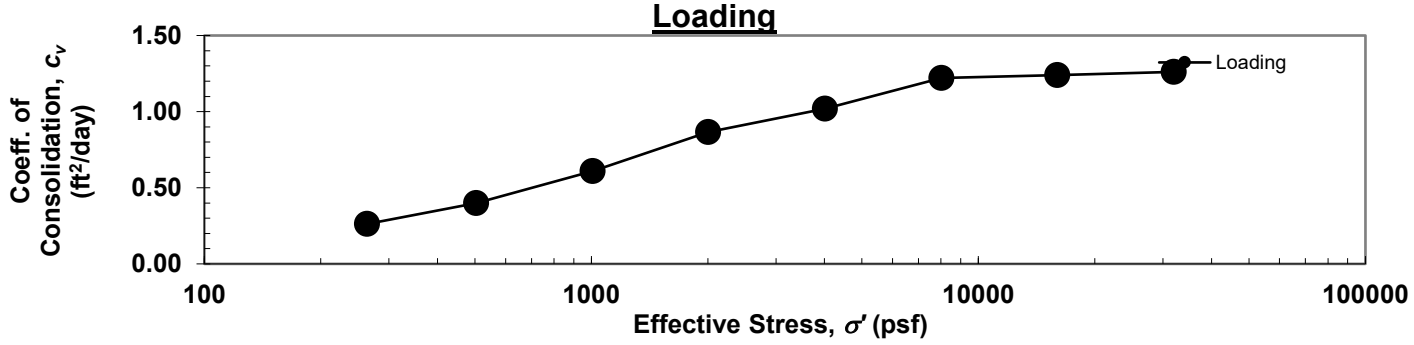
Compression and Swelling Index

Compression Index (Cc): 0.063 | Preconsolidation Pressure (σ_c'): **5500**
Recompression Index (Cr): 0.011 | Over-Consolidation Ratio (OCR): **4.2**

Consolidation Curve



Loading



APPENDIX D

PAVEMENT CORE LOGS

National Engineering & Architectural Services Inc.

Core Log: B-014-0-20 / PC-1

Core Location: SUM-77-24.12 Ghent
IR-77 SB Right Shoulder
41.151314, -81.630974

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/7/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.50” Surface Course - ±3.75” Intermediate Course - ±1.00” Intermediate Course **Total Core Recovery = 6.25"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-2

Core Location: SUM-77-24.12 Ghent
IR-77 SB Left Shoulder
41.156166, -81.626637

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 11/19/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.75” Surface Course - ±4.00” Intermediate Course - ±6.75” Base Course **Total Core Recovery = 12.75"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-3

Core Location: SUM-77-24.12 Ghent
IR-77 SB Right Shoulder
41.157761, -81.626537

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/10/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.50” Surface Course - ±2.00” Intermediate Course - ±6.75” Concrete **Total Core Recovery = 10.25"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-4

Core Location: SUM-77-24.12 Ghent
IR-77 NB Right Shoulder
41.156164, -81.626258

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/11/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.75” Surface Course - ±2.25” Intermediate Course - ±10.75” Base Course **Total Core Recovery = 14.75"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-5

Core Location: SUM-77-24.12 Ghent
IR-77 NB Left Shoulder
41.157724, -81.626171

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/8/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.75” Surface Course - ±6.00” Intermediate Course - ±5.00” Base Course **Total Core Recovery = 12.75"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: B-029-0-20 / PC-6

Core Location: SUM-77-24.12 Ghent
IR-77 NB Right Shoulder
41.163887, -81.625758

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/16/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.25” Surface Course - ±2.25” Intermediate Course - ±2.25” Intermediate Course **Total Core Recovery = 5.75"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-7

Core Location: SUM-77-24.12 Ghent
IR-77 SB Left Shoulder
41.168769, -81.626142

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 11/19/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.50” Surface Course - ±2.75” Intermediate Course - ±7.50” Base Course - ±0.75” Concrete **Total Core Recovery = 12.50"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-8

Core Location: SUM-77-24.12 Ghent
IR-77 SB Right Shoulder
41.169307, -81.626288

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/10/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±3.50” Surface Course - ±6.75” Intermediate Course - ±5.00” Base Course **Total Core Recovery = 15.25"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-9

Core Location: SUM-77-24.12 Ghent
IR-77 NB Left Shoulder
41.168778, -81.625919

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/8/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.75” Surface Course - ±2.50” Intermediate Course - ±6.00” Base Course - ±4.50” Base Course **Total Core Recovery = 14.75"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-10

Core Location: SUM-77-24.12 Ghent
IR-77 NB Right Shoulder
41.169319, -81.625758

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/11/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±2.50” Surface Course - ±2.75” Intermediate Course - ±8.75” Base Course **Total Core Recovery = 14.00"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: B-042-0-20 / PC-11

Core Location: SUM-77-24.12 Ghent
IR-77 SB Right Shoulder
41.178158, -81.626097

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 11/17/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.00” Surface Course - ±2.25” Intermediate Course - ±3.25” Base Course **Total Core Recovery = 6.50"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-12

Core Location: SUM-77-24.12 Ghent
IR-77 SB Left Shoulder
41.188742, -81.625723

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 11/16/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±2.25” Surface Course - ±1.75” Base Course - ±7.25” Intermediate Course - ±1.00” Intermediate Course **Total Core Recovery = 12.25"**

Abbreviations and Notes

Core Log: PC-13

Core Location: SUM-77-24.12 Ghent
IR-77 SB Right Shoulder
41.189286, -81.625880

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/10/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±2.00” Surface Course - ±4.25” Base Course **Total Core Recovery = 6.25"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: PC-14

Core Location: SUM-77-24.12 Ghent
IR-77 NB Right Shoulder
41.188742, -81.625356

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/11/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±2.00” Surface Course - ±2.75” Base Course - ±5.50” Base Course **Total Core Recovery = 10.25"**

Abbreviations and Notes

Core Log: PC-15

Core Location: SUM-77-24.12 Ghent
IR-77 NB Left Shoulder
41.189305, -81.625488

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/8/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.50” Surface Course - ±1.50” Surface Course - ±3.75” Intermediate Course - ±3.5” Intermediate Course - ±4.00” Intermediate Course **Total Core Recovery = 14.25"**

Abbreviations and Notes

National Engineering & Architectural Services Inc.

Core Log: B-057-0-20 / PC-16

Core Location: SUM-77-24.12 Ghent
IR-77 NB Right Shoulder
41.194780, -81.625340

Project: SUM-77-24.12 Ghent, PID 111404 **Date:** 12/8/2020

Location: City of Akron, Summit Co., OH **Core Type / Alignment:** Pavement / IR-77

Client: GPD Group **Coring Crew:** NEAS - CA/JH

Core Barrel Size (O.D.): 4.00" **Hole Patched w/:** Asphalt Patch

Photograph and Core Length	Description and Noted Features of Core Sample
	FACE OF THE CORE IS AT ZERO - ±1.75” Surface Course - ±4.50” Intermediate Course - ±6.00” Base Course **Total Core Recovery = 12.25"**

Abbreviations and Notes

APPENDIX E

SULFATE TEST DATA REPORT

OHIO DEPARTMENT OF TRANSPORTATION

DETERMINING SULFATE CONTENT IN SOILS

SUPPLEMENT 1122

Project C-R-S:	SUM-77-24.12 Ghent
PID No:	111404
Report Date:	1/5/2021
Consultant:	NEAS Inc.
Technician:	L. Rosenbeck

Boring ID & Sample #	Station	Offset	Latitude & Longitude or State Plane Coordinates	Elevation	Soaking Time (hr)	Replicate Sample Readings						Sulfate Content (ppm)
						1		2		3		
						Dilution	Reading	Dilution	Reading	Dilution	Reading	
B-001-0-20 SS-1A					20.67	20	2	20	3	20	3	**53**
B-002-0-20 SS-1					16.42	20	2	20	3	20	3	**53**
B-003-0-20 SS-1					18.6	20	0	20	0	20	0	**0**
B-004-0-20 SS-1					16.43	20	4	20	2	20	4	**67**
B-005-0-20 SS-1					18.58	20	1	20	0	20	1	**13**
B-006-0-20 SS-1					18.58	20	1	20	1	20	1	**20**
B-007-0-20 SS-1					17.42	20	6	20	9	20	7	**147**
B-008-0-20 SS-1					19.62	20	2	20	3	20	3	**53**
B-009-0-20 SS-1					18.85	20	13	20	13	20	12	**253**
B-010-0-20 SS-1					20.17	20	10	20	7	20	9	**173**
B-011-0-20 SS-1					17.47	20	7	20	7	20	6	**133**
B-012-0-20 SS-1					16.12	20	2	20	3	20	2	**47**
B-013-0-20 SS-1					17.33	20	7	20	3	20	7	**113**
B-014-0-20 SS-1					16.42	20	4	20	3	20	4	**73**
B-015-0-20 SS-1					17.33	20	1	20	0	20	1	**13**
B-016-0-20 SS-1					16.11	20	1	20	1	20	1	**20**
B-017-0-20 SS-1					17.75	20	3	20	1	20	2	**40**
B-018-0-20 SS-1					18.85	20	2	20	2	20	2	**40**

B-019-0-20 SS-1A						17.48	20	4	20	4	20	5	**87**
B-020-0-20 SS-1						18.83	20	7	20	7	20	7	**140**
B-021-0-20 SS-1						17.45	20	1	20	1	20	1	**20**
B-022-0-20 SS-1						17.33	20	10	20	4	20	4	**120**
B-023-0-20 SS-1						17.33	20	4	20	6	20	7	**113**
B-024-0-20 SS-1A						17.8	40	50	40	51	40	47	**1973**
B-025-0-20 SS-2						17.45	20	5	20	6	20	5	**107**
B-026-0-20 SS-1						16.42	20	5	20	6	20	6	**113**
B-027-0-20 SS-1						17.82	20	0	20	1	20	1	**13**
B-028-0-20 SS-1						19.82	20	4	20	4	20	3	**73**
B-029-0-20 SS-1						16.11	20	4	20	4	20	4	**80**
B-030-0-20 SS-1						16.44	100	52	100	65	100	47	**5467**
B-032-0-20 SS-1						17.33	20	3	20	5	20	5	**87**
B-033-0-20 SS-1						16.44	20	65	20	70	20	69	**1360**
B-034-0-20 SS-1						19.62	20	13	20	17	20	16	**307**
B-035-0-20 SS-1						17.33	20	8	20	7	20	14	**193**
B-036-0-20 SS-1						19.17	20	2	20	2	20	2	**40**
B-037-0-20 SS-1						17.33	20	17	20	18	20	22	**380**
B-038-0-20 SS-1						16.42	20	7	20	9	20	8	**160**
B-039-0-20 SS-1						17.33	20	8	20	16	20	11	**233**
B-040-0-20 SS-1						19.75	20	2	20	2	20	2	**40**
B-041-0-20 SS-1						17.33	20	5	20	2	20	5	**80**
B-042-0-20 SS-1						19.82	20	8	20	6	20	8	**147**
B-043-0-20 SS-1						17.78	20	4	20	4	20	4	**80**
B-044-0-20 SS-1						17.73	20	2	20	7	20	1	**67**
B-045-0-20 SS-1						19.83	20	10	20	10	20	6	**173**
B-046-0-20 SS-1						19.78	20	5	20	6	20	6	**113**
B-047-0-20 SS-2						16.13	20	6	20	5	20	6	**113**
B-048-0-20 SS-1						17.5	20	8	20	4	20	5	**113**
B-049-0-20 SS-1						19.32	20	20	20	20	20	33	**487**
B-050-0-20 SS-1						17.78	20	4	20	4	20	3	**73**
B-051-0-20 SS-1						16.13	20	3	20	4	20	3	**67**
B-052-0-20 SS-1						17.8	20	2	20	4	20	4	**67**

B-053-0-20 SS-1						17.77	20	2	20	4	20	4	**67**
B-054-0-20 SS-1						19.38	20	1	20	1	20	1	**20**
B-055-0-20 SS-1						19.3	20	6	20	6	20	6	**120**
B-056-0-20 SS-1						19.22	20	14	20	10	20	28	**347**
B-057-0-20 SS-1						17.78	20	4	20	4	20	4	**80**
B-058-0-20 SS-1						19.88	20	4	20	6	20	6	**107**
B-059-0-20 SS-1						20.17	20	6	20	5	20	5	**107**
B-061-0-20-SS-1						19.18	20	0	20	0	20	0	**0**
B-062-0-20 SS-1						16.14	20	1	20	1	20	1	**20**
B-063-0-20 SS-1						17.47	20	7	20	7	20	7	**140**
B-064-0-20 SS-1						17.44	20	2	20	2	20	2	**40**
B-065-0-20 SS-1						17.4	20	1	20	1	20	1	**20**
B-066-0-20 SS-1						17.47	20	3	20	3	20	3	**60**
B-067-0-20 SS-1						17.45	20	2	20	2	20	2	**40**
B-068-0-20 SS-1						18.02	20	43	20	41	20	40	**827**
B-069-0-20 SS-1						18.85	20	1	20	2	20	2	**33**
B-070-0-20 SS-1						17.44	20	1	20	1	20	1	**20**
B-071-0-20 SS-1						18.8	20	1	20	2	20	2	**33**
B-072-0-20 SS-1						18.8	20	14	20	14	20	14	**280**
B-074-0-20 SS-1						17.42	20	5	20	7	20	7	**127**
B-075-0-20 SS-1						17.43	20	18	20	14	20	15	**313**
B-076-0-20 SS-1						17.48	20	5	20	5	20	5	**100**
B-078-0-20 SS-1						17.45	20	4	20	5	20	5	**93**
B-079-0-20 SS-1						19.13	20	15	20	16	20	16	**313**
B-080-0-20 SS-1						16.14	20	1	20	1	20	1	**20**
B-081-0-20 SS-1						19.83	20	1	20	1	20	1	**20**
B-082-0-20 SS-1						17.82	20	7	20	5	20	7	**127**
B-084-0-20 SS-1						16.42	20	0	20	1	20	0	**7**
B-085-0-20 SS-1						18.84	20	3	20	3	20	3	**60**
B-086-0-20 SS-2						18.85	20	2	20	1	20	2	**33**
B-087-0-20 SS-1						18.05	40	30	40	30	40	30	**1200**
B-088-0-20 SS-1						20.17	20	4	20	5	20	5	**93**
B-089-0-20 SS-2						20.17	20	4	20	6	20	6	**107**

B-090-0-20 SS-2						20.17	20	9	20	7	20	9	**167**
B-091-0-20 SS-1						20.17	20	7	20	9	20	9	**167**
B-092-0-20 SS-1						21.17	20	16	20	15	20	16	**313**
B-093-0-20 SS-1						21.17	20	5	20	4	20	5	**93**
B-094-0-20 SS-1						21.17	20	4	20	4	20	4	**80**
B-095-0-20 SS-1						21.17	40	43	40	42	40	47	**1760**
B-096-0-20 SS-2						21.17	20	10	20	8	20	10	**187**
B-097-0-20 SS-1						18.58	20	0	20	1	20	1	**13**

APPENDIX F

GEOTECHNICAL BULLETIN 1 (GB1) ANALYSIS SPREADSHEETS

ENTIRE PROJECT

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404

Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

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NO. OF BORINGS: 95

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-20	IR-77 NB	300+01	18	LT	CME 55X	82	1012.4	1010.9	1.5 C
2	B-002-0-20	IR-77 SB	403+91	3	LT	CME 55X	82	1012.2	1010.7	1.5 C
3	B-003-0-20	IR-77 NB	307+04	16	LT	CME 55X	82	1007.0	1007.6	0.6 F
4	B-004-0-20	IR-77 SB	408+18	9	LT	CME 55X	82	1016.3	1014.8	1.5 C
5	B-005-0-20	IR-77 NB	310+99	15	LT	CME 55X	82	1006.1	1004.6	1.5 C
6	B-006-0-20	IR-77 SB	411+96	6	RT	CME 55X	82	1015.9	1015.5	0.4 C
7	B-007-0-20	IR-77 NB	315+00	41	RT	CME 45B	82	1002.0	1000.5	1.5 C
8	B-008-0-20	IR-77 SB	415+88	9	LT	CME 55X	82	1015.5	1014.0	1.5 C
9	B-009-0-20	IR-77 NB	319+10	1	LT	CME 55X	82	999.0	997.5	1.5 C
10	B-010-0-20	IR-77 SB	419+97	15	RT	CME 55X	82	1008.2	1008.3	0.1 F
11	B-011-0-20	IR-77 NB	323+93	2	LT	CME 55X	82	995.0	993.5	1.5 C
12	B-012-0-20	IR-77 SB	424+12	9	RT	CME 55X	82	1000.6	999.1	1.5 C
13	B-013-0-20	IR-77 NB	328+78	16	LT	CME 55X	82	988.5	988.0	0.5 C
14	B-014-0-20	IR-77 SB	428+74	41	LT	CME 55X	82	988.8	987.3	1.5 C
15	B-015-0-20	IR-77 NB	332+00	16	LT	CME 55X	82	982.8	982.1	0.7 C
16	B-016-0-20	IR-77 SB	432+37	1	RT	CME 55X	82	981.2	979.7	1.5 C
17	B-017-0-20	IR-77 NB	336+02	13	LT	CME 55X	82	972.9	972.4	0.5 C
18	B-018-0-20	IR-77 SB	436+21	0	RT	CME 55X	82	971.7	970.2	1.5 C
19	B-019-0-20	IR-77 NB	340+31	1	LT	CME 55X	82	963.9	962.4	1.5 C
20	B-020-0-20	IR-77 SB	440+21	1	RT	CME 55X	82	961.8	960.3	1.5 C
21	B-021-0-20	IR-77 NB	343+97	3	LT	CME 55X	82	955.0	953.5	1.5 C
22	B-022-0-20	IR-77 SB	443+14	12	RT	CME 55X	82	954.4	953.9	0.5 C
23	B-023-0-20	IR-77 NB	348+72	6	LT	CME 55X	82	949.5	948.0	1.5 C
24	B-024-0-20	IR-77	660+27	14	LT	CME 55X	82	962.0	961.6	0.4 C
25	B-025-0-20	IR-77	664+36	39	RT	CME 55X	82	973.1	971.6	1.5 C
26	B-026-0-20	IR-77	668+28	33	LT	CME 55X	82	982.2	981.2	1.0 C
27	B-027-0-20	IR-77	672+27	30	RT	CME 55X	82	990.9	990.9	0.0 F
28	B-028-0-20	IR-77	676+34	39	LT	CME 55X	82	999.0	997.5	1.5 C
29	B-029-0-20	IR-77	680+33	71	RT	CME 45B	82	1001.8	1000.3	1.5 C
30	B-030-0-20	IR-77	684+31	29	LT	CME 55X	82	1002.6	1002.4	0.2 C
31	B-031-0-20	IR-77	688+28	41	RT	CME 55X	82	1006.3	1004.8	1.5 C
32	B-032-0-20	IR-77	692+52	26	LT	CME 55X	82	1007.1	1006.4	0.7 C
33	B-033-0-20	IR-77	696+54	35	RT	CME 55X	82	1009.6	1008.1	1.5 C
34	B-034-0-20	IR-77	701+52	23	LT	CME 55X	82	1014.7	1013.2	1.5 C
35	B-035-0-20	IR-77	705+15	25	RT	CME 55X	82	1021.6	1020.5	1.1 C
36	B-036-0-20	IR-77	708+46	32	LT	CME 55X	82	1031.1	1030.5	0.6 C
37	B-037-0-20	IR-77	712+59	47	RT	CME 55X	82	1044.8	1043.3	1.5 C
38	B-038-0-20	IR-77	716+54	34	LT	CME 55X	82	1055.8	1055.0	0.8 C
39	B-039-0-20	IR-77	720+49	34	RT	CME 55X	82	1067.4	1066.7	0.7 C
40	B-040-0-20	IR-77	724+53	41	LT	CME 55X	82	1080.3	1078.8	1.5 C
41	B-041-0-20	IR-77	728+54	33	RT	CME 55X	82	1091.5	1090.9	0.6 C
42	B-042-0-20	IR-77	732+51	71	LT	CME 55X	82	1104.1	1102.6	1.5 C
43	B-043-0-20	IR-77	736+56	40	RT	CME 55X	82	1116.6	1115.1	1.5 C
44	B-044-0-20	IR-77	740+56	34	LT	CME 55X	82	1127.6	1127.0	0.6 C
45	B-045-0-20	IR-77	744+53	32	RT	CME 55X	82	1139.4	1139.1	0.3 C

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
46	B-046-0-20	IR-77	748+52	41	LT	CME 55X	82	1152.3	1150.8	1.5 C
47	B-047-0-20	IR-77	752+52	32	RT	CME 55X	82	1162.3	1161.6	0.7 C
48	B-048-0-20	IR-77	756+55	41	LT	CME 55X	82	1170.9	1169.4	1.5 C
49	B-049-0-20	IR-77	760+56	31	RT	CME 55X	82	1174.8	1174.1	0.7 C
50	B-050-0-20	IR-77	764+57	33	LT	CME 55X	82	1178.7	1177.2	1.5 C
51	B-051-0-20	IR-77	768+59	32	RT	CME 55X	82	1181.9	1180.4	1.5 C
52	B-052-0-20	IR-77	773+45	23	LT	CME 55X	82	1183.0	1181.5	1.5 C
53	B-053-0-20	IR-77	777+09	19	RT	CME 55X	82	1179.2	1179.2	0.0 F
54	B-054-0-20	IR-77	781+04	27	LT	CME 55X	82	1176.1	1175.3	0.8 C
55	B-055-0-20	IR-77	784+58	35	RT	CME 55X	82	1173.2	1171.8	1.4 C
56	B-056-0-20	IR-77	789+10	34	LT	CME 55X	82	1168.1	1167.5	0.6 C
57	B-057-0-20	IR-77	793+08	72	RT	CME 55X	82	1164.9	1163.4	1.5 C
58	B-058-0-20	IR-77	797+10	38	LT	CME 55X	82	1161.2	1159.7	1.5 C
59	B-059-0-20	IR-77	799+87	99	RT	CME 45B	82	1158.4	1156.9	1.5 C
60	B-060-0-20	IR-77	805+10	40	LT	CME 55X	82	1160.8	1159.3	1.5 C
61	B-061-0-20	IR-77	809+75	34	RT	CME 55X	82	1162.0	1161.5	0.5 C
62	B-062-0-20	IR-77	813+15	40	LT	CME 55X	82	1164.5	1163.0	1.5 C
63	B-063-0-20	IR-77	816+93	27	RT	CME 55X	82	1165.0	1164.7	0.3 C
64	B-064-0-20	IR-77 SB	409+38	50	LT	CME 55X	82	1015.5	1014.0	1.5 C
65	B-065-0-20	Ramp S	14+70	17	LT	CME 55X	82	1016.2	1014.7	1.5 C
66	B-066-0-20	Ramp S	18+82	9	LT	CME 55X	82	1013.4	1011.9	1.5 C
67	B-067-0-20	Ramp S	22+92	4	LT	CME 55X	82	1009.5	1008.0	1.5 C
68	B-068-0-20	Ramp P	225+67	7	LT	CME 55X	82	997.0	995.5	1.5 C
69	B-069-0-20	Ramp P	221+81	15	RT	CME 55X	82	1007.8	1006.3	1.5 C
70	B-070-0-20	Ramp P	218+57	15	RT	CME 55X	82	1009.4	1007.9	1.5 C
71	B-071-0-20	Ramp P	214+18	17	RT	CME 55X	82	1003.7	1002.2	1.5 C
72	B-072-0-20	Ramp R	17+63	9	LT	CME 55X	82	1006.1	1004.6	1.5 C
73	B-073-0-20	Ramp L	116+93	1	RT	CME 45B	82	1000.2	998.7	1.5 C
74	B-074-0-20	Ramp L	118+92	0	LT	CME 45B	82	998.0	996.5	1.5 C
75	B-075-0-20	Ramp L	120+95	15	RT	CME 45B	82	996.4	994.9	1.5 C
76	B-076-0-20	Ramp L	122+95	25	RT	CME 45B	82	998.8	997.8	1.0 C
77	B-077-0-20	Ramp L	124+91	12	RT	CME 45B	82	1003.3	1002.3	1.0 C
78	B-078-0-20	Ramp L	126+90	5	RT	CME 45B	82	1007.6	1006.6	1.0 C
79	B-079-0-20	Ghent Road	85+42	13	RT	CME 45B	82	999.3	997.8	1.5 C
80	B-080-0-20	Ramp M	127+44	73	RT	CME 45B	82	1002.8	1001.3	1.5 C
81	B-081-0-20	Ramp N	27+99	26	LT	CME 45B	82	1010.5	1009.0	1.5 C
82	B-082-0-20	Ramp N	31+00	35	RT	CME 45B	82	992.2	990.7	1.5 C
83	B-083-0-20	IR-77 NB	336+08	58	RT	CME 45B	82	975.5	974.0	1.5 C
84	B-084-0-20	IR-77	786+82	97	LT	CME 55X	82	1170.5	1169.0	1.5 C
85	B-085-0-20	Ramp D	23+06	14	RT	CME 55X	82	1160.1	1158.6	1.5 C
86	B-086-0-20	Ramp C	99+01	13	RT	CME 55X	82	1154.7	1153.2	1.5 C
87	B-087-0-20	Ramp C	103+04	16	RT	CME 55X	82	1158.4	1156.9	1.5 C
88	B-088-0-20	Ramp C	107+16	1	LT	CME 45B	82	1161.3	1159.8	1.5 C
89	B-089-0-20	Ramp A	88+52	17	LT	CME 45B	82	1162.0	1160.5	1.5 C
90	B-090-0-20	Ramp B	7+13	9	LT	CME 45B	82	1159.2	1157.7	1.5 C

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
91	B-091-0-20	IR-77	803+00	92	RT	CME 45B	82	1159.8	1158.3	1.5 C
92	B-092-0-20	IR-77 SB	413+49	12	RT	CME 55X	82	1014.1	1015.1	1.0 F
93	B-093-0-20	IR-77 SB	416+09	22	RT	CME 55X	82	1011.3	1013.2	1.9 F
94	B-095-0-20	IR-77 NB	313+26	16	LT	CME 55X	82	1002.2	1002.3	0.1 F
95	B-096-0-20	IR-77 NB	316+24	25	LT	CME 55X	82	998.9	1000.0	1.1 F

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	2.7	0.0	1.2	19			NP	NP	NP	16	6	22	8	6	A-1-b	0	100					
	001-0	SS-2	2.7	4.5	1.2	3.0	22		3.75	33	20	13	54	41	95	18	15	A-6a	9			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	25	19	4.5							15	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	10									10	8	A-3a	0	100					
	002-0	SS-2	3.0	4.5	1.5	3.0	33		4.5	30	19	11	47	23	70	15	14	A-6a	7						
	20	SS-3	4.5	6.0	3.0	4.5	22		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	10	10	2.25	34	21	13	43	36	79	18	16	A-6a	9						
3	B	SS-1	0.0	1.5	0.6	2.1	12			NP	NP	NP	21	6	27	8	8	A-3a	0	100					
	003-0	SS-2	1.5	3.0	2.1	3.6	11									10	8	A-3a	0						
	20	SS-3	3.0	4.5	3.6	5.1	7									9	8	A-3a	0						
		SS-4	4.5	6.0	5.1	6.6	7	7	1.5	25	18	7	50	25	75	23	13	A-4b							
4	B	SS-1	1.5	3.0	0.0	1.5	15									10	10	A-2-6	4	100					
	004-0	SS-2	3.0	4.5	1.5	3.0	26		4.25	24	15	9	25	13	38	11	10	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	10	10	2	29	17	12	31	21	52	16	12	A-4a	4						
5	B	SS-2	1.5	3.0	0.0	1.5	16			NP	NP	NP	13	3	16	8	6	A-1-b	0	100					
	005-0	SS-3	3.0	4.5	1.5	3.0	16									8	6	A-1-b	0						
	20	SS-4	4.5	6.0	3.0	4.5	8		1.5							25	10	A-4a	8						
								8																	
6	B	SS-1	0.0	1.5	-0.4	1.1	25		4.5	28	20	8	31	16	47	11	15	A-4a	2	100					
	006-0	SS-2	1.5	3.0	1.1	2.6	8									17	10	A-4a	8			N_{60} & Mc		12"	
	20	SS-3	3.0	4.5	2.6	4.1	7		4.25	29	17	12	40	27	67	16	14	A-6a	7						
		SS-4	4.5	6.0	4.1	5.6	14	7	4.25							16	14	A-6a	10						
7	B	SS-1	1.5	3.0	0.0	1.5	18		4.5	28	17	11	39	17	56	11	14	A-6a	5	150					
	007-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	27	17	10	33	19	52	12	12	A-4a	3						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.25							16	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	16	4.25							14	10	A-4a	8						
8	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	8	28	12	8	A-3a	0	100					
	008-0	SS-2	3.0	4.5	1.5	3.0	8		2.5							16	10	A-4a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	15		3	24	16	8	32	20	52	15	11	A-4a	3						
		SS-4	6.0	7.5	4.5	6.0	18	8	1.5							15	10	A-4a	8						
9	B	SS-1	1.5	3.0	0.0	1.5	15									11	10	A-2-4	0	250					
	009-0	SS-2	3.0	4.5	1.5	3.0	7		0.5	26	17	9	32	15	47	16	12	A-4a	2			HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		3.75	26	17	9	32	15	47	13	12	A-4a	2						
		SS-4	6.0	7.5	4.5	6.0	10	7	2.5							18	10	A-4a	8						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	0.0	1.5	0.1	1.6	23		4.5	28	17	11	37	21	58	11	14	A-6a	5	170					
	010-0	SS-2	1.5	3.0	1.6	3.1	38		4.5	28	15	13	25	17	42	13	14	A-6a	2						
	20	SS-3	3.0	4.5	3.1	4.6	22		4.5							15	14	A-6a	10						
		SS-4	4.5	6.0	4.6	6.1	14	14	4.5							14	14	A-6a	10						
11	B	SS-1	1.5	3.0	0.0	1.5	16		1.75	25	16	9	38	26	64	15	11	A-4a	6	130		HP & Mc		**12"**	
	011-0	SS-2	3.0	4.5	1.5	3.0	12		2	25	16	9	27	12	39	14	11	A-4a	1			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	7		2.5							17	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	14	7	2.5							16	10	A-4a	8						
12	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	17	6	23	12	6	A-1-b	0	100					
	012-0	SS-2	3.0	4.5	1.5	3.0	11									11	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	11									13	6	A-1-b	0						
		SS-4	6.0	7.5	4.5	6.0	11	11		24	16	8	21	13	34	13	10	A-2-4	0						
13	B	SS-1	0.0	1.5	-0.5	1.0	15			NP	NP	NP	22	10	32	11	10	A-2-4	0	110					
	013-0	SS-2	1.5	3.0	1.0	2.5	31		4.5	29	19	10	50	36	86	18	14	A-4b	8		A-4b	Mc	**30"**		
	20	SS-3	3.0	4.5	2.5	4.0	30		4.5							18	10	A-4b	8						
		SS-4	4.5	6.0	4.0	5.5	18	15	4.5							14	10	A-4b	8						
14	B	SS-1	1.5	3.0	0.0	1.5	26			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	014-0	SS-2	3.0	4.5	1.5	3.0	27									12	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	14		2.25	20	13	7	24	13	37	11	10	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	19	14								16	10	A-2-4	0						
15	B	SS-1	0.0	1.5	-0.7	0.8	20									8	6	A-1-b	0	100					
	015-0	SS-2	1.5	3.0	0.8	2.3	34			NP	NP	NP	13	3	16	6	6	A-1-b	0						
	20	SS-3	3.0	4.5	2.3	3.8	20									10	6	A-1-b	0						
		SS-4	4.5	6.0	3.8	5.3	16	16								7	6	A-1-b	0						
16	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	016-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP				10	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	26									9	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	25	16								12	8	A-3a	0						
17	B	SS-1	0.0	1.5	-0.5	1.0	11			NP	NP	NP	14	12	26	12	8	A-3a	0	100					
	017-0	SS-2	1.5	3.0	1.0	2.5	14			35	19	16	13	12	25	15	10	A-2-6	1			N_{60} & Mc		**12"**	
	20	SS-3	3.0	4.5	2.5	4.0	10									15	10	A-2-6	4						
		SS-4	4.5	6.0	4.0	5.5	4	4								16	10	A-2-6	4						
18	B	SS-1	1.5	3.0	0.0	1.5	16									11	10	A-4a	8	100					
	018-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP	25	11	36	8	11	A-4a	0						
	20	SS-3	4.5	6.0	3.0	4.5	23									7	6	A-1-b	0						
		SS-4A	6.0	7.2	4.5	5.7	11	11								7	6	A-1-b	0						

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Subgrade Analysis

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
19	B	SS-1A	1.5	2.0	0.0	0.5	20		4							12	10	A-4a	8	100					
	019-0	SS-1B	2.0	3.0	0.5	1.5	20			NP	NP	NP	14	3	17	9	8	A-3a	0						
	20	SS-2A	3.0	4.0	1.5	2.5	27			NP	NP	NP	13	4	17	8	6	A-1-b	0						
		SS-2B	4.0	4.5	2.5	3.0	27	20	1							14	10	A-4a	8			HP & Mc			
20	B	SS-1	1.5	3.0	0.0	1.5	29									10	10	A-2-4	0	140					
	020-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	24	7	31	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	19									6	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	10	10								6	8	A-3a	0						
21	B	SS-1	1.5	3.0	0.0	1.5	19									10	8	A-3a	0	100					
	021-0	SS-2	3.0	4.5	1.5	3.0	18		3.25	21	17	4	39	12	51	17	12	A-4a	3			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									13	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	14	14	3.25	24	17	7	42	20	62	23	12	A-4a	5						
22	B	SS-1	0.0	1.5	-0.5	1.0	10		3	27	17	10	30	17	47	12	12	A-4a	2	120		N_{60}		**12"**	
	022-0	SS-2	1.5	3.0	1.0	2.5	25		4.5							11	10	A-4a	8						
	20	SS-3	3.0	4.5	2.5	4.0	19		4.5							12	10	A-4a	8						
		SS-4	4.5	6.0	4.0	5.5	12	10	4.5	31	17	14	37	30	67	14	12	A-4a	8						
23	B	SS-1	1.5	3.0	0.0	1.5	20		4.5							20	14	A-6a	10	110		Mc			
	023-0	SS-2	3.0	4.5	1.5	3.0	15		4.5	31	20	11	37	19	56	14	15	A-6a	5						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	16	15	4.5	39	20	19	48	39	87	19	16	A-6b	12						
24	B	SS-1A	0.0	1.0	-0.4	0.6	82		4.5							10	6	A-1-b	0	2000					
	024-0	SS-2	1.0	3.0	0.6	2.6	35		4.5	30	18	12	41	31	72	15	14	A-6a	8						
	20	SS-3	3.0	4.5	2.6	4.1	18		4.5	35	19	16	41	36	77	17	16	A-6b	10						
		SS-4	4.5	6.0	4.1	5.6	19	18	4.5							18	16	A-6b	16						
25	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	28	18	10	52	32	84	20	13	A-4b	8		A-4b	N_{60} & Mc		**12"**	
	025-0	SS-2	3.0	4.5	1.5	3.0	12		2.75							19	10	A-4b	8	110	A-4b	N_{60} & Mc	**36"**		
	20	SS-3	4.5	6.0	3.0	4.5	29		3.5	24	16	8	24	13	37	13	11	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	12	12	3.25							22	10	A-4a	8						
26	B	SS-1	0.0	1.5	-1.0	0.5	11		4.5	23	16	7	33	21	54	11	11	A-4a	4	110		N_{60}		**12"**	
	026-0	SS-2	1.5	3.5	0.5	2.5	38		3.5	25	19	6	75	23	98	26	14	A-4b	8		A-4b	Mc	**30"**		
	20	SS-3B	3.5	4.5	2.5	3.5	20									10	8	A-3	0						
		SS-4	4.5	6.0	3.5	5.0	20	11								10	8	A-3	0						
27	B	SS-1	0.0	1.5	0.0	1.5	14			NP	NP	NP	28	13	41	10	11	A-4a	1	100					
	027-0	SS-2	1.5	3.0	1.5	3.0	16			NP	NP	NP	85	12	97	25	11	A-4b	8		A-4b	Mc			
	20	SS-3	3.0	4.5	3.0	4.5	14									15	8	A-3a	0						
		SS-4	4.5	6.0	4.5	6.0	10	10								22	10	A-4a	8						

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
28	B	SS-1	1.5	3.0	0.0	1.5	11		4.5	22	15	7	33	22	55	13	10	A-4a	4	100		N_{60} & Mc		12"	
	028-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	26	17	9	42	30	72	14	12	A-4a	7						
	20	SS-3	4.5	6.0	3.0	4.5	18		3							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	23	11	2.25							15	14	A-6a	10						
29	B	SS-1	1.5	3.0	0.0	1.5	20									8	10	A-2-4	0	100					
	029-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	22	7	29	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5	19	13	6	23	9	32	12	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	26	20								6	8	A-3a	0						
30	B	SS-1	0.0	1.5	-0.2	1.3	15		4.5	28	18	10	36	22	58	12	13	A-4a	5	5500					
	030-0	SS-2	1.5	3.0	1.3	2.8	26		4.5	28	17	11	38	28	66	12	14	A-6a	7						
	20	SS-3	3.0	4.5	2.8	4.3	19		4.5							13	14	A-6a	10						
		SS-4	4.5	6.0	4.3	5.8	12	12	4.25							14	14	A-6a	10						
31	B	SS-1	1.5	3.0	0.0	1.5	18		4.25	26	16	10	13	11	24	14	10	A-2-4	0			Mc			
	031-0	SS-2	3.0	4.5	1.5	3.0	19		2	26	17	9	46	33	79	21	12	A-4a	8			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	12		4.5							24	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	12	3							26	10	A-4a	8						
32	B	SS-1	0.7	1.5	0.0	0.8	5		2.25	32	20	12	36	20	56	17	15	A-6a	5	100		N_{60}		21"	12"
	032-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	33	18	15	43	32	75	15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	22		4.5							15	10	A-4a	8						
		SS-4	4.5	6.0	3.8	5.3	11	5	4							20	10	A-4a	8						
33	B	SS-1	1.5	3.0	0.0	1.5	25		4.5	32	18	14	38	30	68	13	14	A-6a	8	1400					
	033-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	28	17	11	37	24	61	12	14	A-6a	6						
	20	SS-3	4.5	6.0	3.0	4.5	16		4.5							12	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	18	16	4.5							13	14	A-6a	10						
34	B	SS-1	1.5	3.0	0.0	1.5	15		4.5	25	15	10	28	15	43	12	10	A-4a	2	310					
	034-0	SS-2	3.0	4.5	1.5	3.0	12		4.25	25	15	10	29	18	47	13	10	A-4a	2			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	15	12	4.5							17	14	A-6a	10						
35	B	SS-1	0.0	1.5	-1.1	0.4	10		4.5	32	18	14	38	23	61	16	14	A-6a	7	190		N_{60}		12"	
	035-0	SS-2	1.5	3.0	0.4	1.9	25		4.5	31	19	12	30	20	50	12	14	A-6a	4						
	20	SS-3	3.0	4.5	1.9	3.4	27		1.5							24	14	A-6a	10			HP & Mc			
		SS-4	4.5	6.0	3.4	4.9	14	10	3							16	14	A-6a	10						
36	B	SS-1	0.0	1.5	-0.6	0.9	10		4.5	26	17	9	28	15	43	15	12	A-4a	2	100		N_{60} & Mc		12"	
	036-0	SS-2	1.5	3.0	0.9	2.4	22		4.5	34	18	16	40	27	67	15	16	A-6b	9						
	20	SS-3	3.0	4.5	2.4	3.9	23		4.5							18	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	18	10	4.5	34	19	15	37	20	57	12	14	A-6a	6						

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Subgrade Analysis

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
37	B	SS-1	1.5	3.0	0.0	1.5	14									18	14	A-6a	10	380		N_{60} & Mc		12"	
	037-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	39	22	17	36	31	67	17	17	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	23		3.5	29	19	10	27	14	41	11	14	A-4a	1						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
38	B	SS-1	0.0	1.5	-0.8	0.8	10		4.5	31	19	12	36	20	56	13	14	A-6a	5	160		N_{60}		12"	
	038-0	SS-2	1.5	3.0	0.8	2.3	27		4.5							15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	15		4.5							14	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	26	10	4.5	30	19	11	43	32	75	13	14	A-6a	8						
39	B	SS-1	0.0	1.5	-0.7	0.8	11		4.5	30	17	13	39	25	64	13	14	A-6a	7	230		N_{60}		12"	
	039-0	SS-2	1.5	3.0	0.8	2.3	38		4.5							11	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	18		4.5							12	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	18	11	4.5	22	15	7	31	14	45	12	10	A-4a	2						
40	B	SS-1	1.5	3.0	0.0	1.5	31		3	18	13	5	28	12	40	11	10	A-4a	1	100					
	040-0	SS-2	3.0	4.5	1.5	3.0	34			NP	NP	NP	28	13	41	10	11	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	41									9	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	33	30								9	10	A-4a	8						
41	B	SS-1	0.0	1.5	-0.6	0.9	30									7	10	A-2-4	0	100					
	041-0	SS-2	1.5	2.0	0.9	1.4	50									7	6	A-1-a	0						
	20	SS-3	3.0	4.5	2.4	3.9	52		4.25	41	25	16	33	12	45	13	22	A-7-6	4						
		SS-4	4.5	6.0	3.9	5.4	66	30	4.5							8	18	A-7-6	16						
42	B	SS-1	1.5	3.0	0.0	1.5	29			22	16	6	25	9	34	8	10	A-2-4	0	150					
	042-0	SS-2	3.0	4.3	1.5	2.8	50									8	0	Rock	0		Rock	Mc			
	20	SS-3	4.5	5.4	3.0	3.9	50									6	0	Rock	0						
		SS-4	6.0	6.5	4.5	5.0	50	29									0	Rock	0						
43	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	19	5	24	8	6	A-1-b	0	100					
	043-0	SS-2	3.0	4.5	1.5	3.0	27									16	10	A-2-4	0			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	18	16								11	8	A-3a	0						
44	B	SS-1	0.0	1.5	-0.6	0.9	7		4.5	29	21	8	38	21	59	14	16	A-4a	5	100		N_{60}		15"	
	044-0	SS-2	1.5	3.0	0.9	2.4	11		4.25	25	18	7	42	20	62	15	13	A-4a	5			N_{60}		12"	
	20	SS-3	3.0	4.5	2.4	3.9	3									23	10	A-4a	8						
		SS-4	4.5	6.0	3.9	5.4	22	3								12	10	A-2-6	4						
45	B	SS-1	0.0	1.5	-0.3	1.2	15		4.5	25	18	7	33	19	52	13	13	A-4a	3	170					
	045-0	SS-2	1.5	3.0	1.2	2.7	15		4.25	21	15	6	33	16	49	12	10	A-4a	3						
	20	SS-3	3.0	4.5	2.7	4.2	11		2.5							13	10	A-4a	8						
		SS-4	4.5	6.0	4.2	5.7	19	11	4.5							12	10	A-4a	8						

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Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
46	B	SS-1	1.5	3.0	0.0	1.5	11		2.25	23	14	9	32	16	48	13	10	A-4a	3	110		N_{60} & Mc		12"	
	046-0	SS-2	3.0	4.5	1.5	3.0	20		4.5	27	17	10	43	24	67	14	12	A-4a	6						
	20	SS-3	4.5	6.0	3.0	4.5	18		4.5							13	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	26	11	4.5							15	10	A-4a	8						
47	B	SS-1	0.0	1.5	-0.7	0.8	16		4.5	25	16	9	34	22	56	11	11	A-4a	4						
	047-0	SS-2	1.5	3.0	0.8	2.3	45		4.5							13	10	A-4a	8	110		Mc			
	20	SS-3	3.0	4.5	2.3	3.8	20		4.5	34	19	15	37	42	79	18	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	16	16	3							17	14	A-6a	10						
48	B	SS-1	1.5	3.0	0.0	1.5	19									8	6	A-1-b	0	110					
	048-0	SS-2	3.0	4.5	1.5	3.0	18		4.5	34	17	17	39	29	68	15	16	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5							16	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	20	18	4.5							21	16	A-6b	16						
49	B	SS-1	0.0	1.5	-0.7	0.8	14		3.75	39	20	19	34	24	58	17	16	A-6b	8	490					
	049-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	41	20	21	44	33	77	19	18	A-7-6	13						
	20	SS-3	3.0	4.5	2.3	3.8	16		4.25							17	18	A-7-6	16						
		SS-4	4.5	6.0	3.8	5.3	12	12	3.75							19	18	A-7-6	16						
50	B	SS-1	1.5	3.0	0.0	1.5	31		4.5	27	18	9	25	14	39	11	13	A-4a	1	100					
	050-0	SS-2	3.0	4.5	1.5	3.0	29		4.5	36	20	16	33	20	53	11	16	A-6b	6						
	20	SS-3	4.5	6.0	3.0	4.5	31		4.5							9	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	63	29	4.5							10	16	A-6b	16						
51	B	SS-1	1.5	3.0	0.0	1.5	31		4.5							12	10	A-4a	8	100					
	051-0	SS-2	3.0	4.5	1.5	3.0	31		4.5	26	18	8	30	15	45	10	13	A-4a	2						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5	31	17	14	34	21	55	12	14	A-6a	6						
		SS-4	6.0	7.5	4.5	6.0	22	19	4.25							16	14	A-6a	10						
52	B	SS-1	1.5	3.0	0.0	1.5	16		3	25	17	8	23	10	33	10	10	A-2-4	0	100					
	052-0	SS-2	3.0	4.5	1.5	3.0	18			NP	NP	NP	10	4	14	6	6	A-1-a	0						
	20	SS-3	4.5	6.0	3.0	4.5	45									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	22	16								11	10	A-2-4	0						
53	B	SS-1	0.0	1.5	0.0	1.5	7		4	36	22	14	31	18	49	17	17	A-6a	4	100		N_{60}		15"	
	053-0	SS-2	1.5	3.0	1.5	3.0	15		4.5	34	21	13	47	28	75	19	16	A-6a	9			Mc			
	20	SS-3	3.0	4.5	3.0	4.5	20		4.5							23	14	A-6a	10						
		SS-4	4.5	6.0	4.5	6.0	23	7	4.5							16	14	A-6a	10						
54	B	SS-1	0.0	1.5	-0.8	0.7	8		2.5	35	20	15	28	17	45	15	15	A-6a	4	100		N_{60}		12"	
	054-0	SS-2	1.5	3.0	0.7	2.2	23		4.5	28	18	10	44	29	73	15	13	A-4a	8						
	20	SS-3	3.0	4.5	2.2	3.7	15		2.75							16	10	A-4a	8						
		SS-4	4.5	6.0	3.7	5.2	15	8	2.25							16	10	A-4a	8						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
55	B	SS-1	0.0	1.5	-1.4	0.1	10		1.5	39	22	17	31	24	55	20	17	A-6b	7	120		HP & Mc		**12"**	
	055-0	SS-2	1.5	3.0	0.1	1.6	15		4.5	37	20	17	40	47	87	18	16	A-6b	11						
	20	SS-3	3.0	4.5	1.6	3.1	22		3.25							18	16	A-6b	16						
		SS-4	4.5	6.0	3.1	4.6	15	10	1.75							14	16	A-6b	16						
56	B	SS-1	0.0	1.5	-0.6	0.9	14		2.5	30	17	13	39	25	64	14	14	A-6a	7	350					
	056-0	SS-2	1.5	3.0	0.9	2.4	19		3.75	37	20	17	37	23	60	17	16	A-6b	8						
	20	SS-3	3.0	4.5	2.4	3.9	23		2.75							16	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	14	14	3							14	16	A-6b	16						
57	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	36	14	50	10	11	A-4a	3	100					
	057-0	SS-2	3.0	4.5	1.5	3.0	15			NP	NP	NP	19	11	30	11	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	12									18	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	11	11	2.5							17	14	A-6a	10						
58	B	SS-1	1.5	3.0	0.0	1.5	11		4.5	29	18	11	22	14	36	12	13	A-4a	0	110		N_{60}		**12"**	
	058-0	SS-2	3.0	4.5	1.5	3.0	8		2.25	38	35	3	33	16	49	20	30	A-6b	3			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	5		2							15	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	7	5	3							20	16	A-6b	16						
59	B	SS-1	1.5	3.0	0.0	1.5	12		4.5	26	15	11	31	21	52	13	14	A-6a	4	110					
	059-0	SS-2	3.0	4.5	1.5	3.0	15		4.25	24	14	10	32	21	53	14	10	A-4a	4			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		2.25							18	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	10	2							20	10	A-4a	8						
60	B	SS-1	1.5	3.0	0.0	1.5	14		3.5	18	13	5	26	13	39	11	10	A-4a	1						
	060-0	SS-2	3.0	4.5	1.5	3.0	31		1.5	27	15	12	31	20	51	15	14	A-6a	4			HP			
	20	SS-3	4.5	6.0	3.0	4.5	20		4.5							10	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
61	B	SS-1	0.0	1.5	-0.5	1.0	8		2	38	27	11	28	17	45	15	22	A-6a	2	100		N_{60}		**12"**	
	061-0	SS-2	1.5	3.0	1.0	2.5	11		2	42	30	12	32	18	50	20	25	A-6a	4			N_{60}		**12"**	
	20	SS-3	3.0	4.5	2.5	4.0	11		2.5							19	14	A-6a	10						
		SS-4	4.5	6.0	4.0	5.5	19	8	4.5							13	10	A-4a	8						
62	B	SS-1	1.5	3.0	0.0	1.5	29									9	8	A-3a	0	100					
	062-0	SS-2	3.0	4.5	1.5	3.0	27		4.5	30	19	11	44	41	85	15	14	A-6a	8						
	20	SS-3	4.5	6.0	3.0	4.5	33		4.5	32	18	14	40	35	75	15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	35	27	4.5							14	14	A-6a	10						
63	B	SS-1	0.0	1.5	-0.3	1.2	11		2.25	30	17	13	29	24	53	17	14	A-6a	5	140		N_{60} & Mc		**12"**	
	063-0	SS-2	1.5	3.0	1.2	2.7	8		2.25	43	21	22	38	47	85	23	18	A-7-6	13			N_{60} & Mc			
	20	SS-3	3.0	4.5	2.7	4.2	15		1.5							24	18	A-7-6	16						
		SS-4	4.5	6.0	4.2	5.7	18	8	1.75							28	18	A-7-6	16						

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Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
64	B	SS-1	1.5	3.0	0.0	1.5	15		4.5	26	16	10	37	22	59	15	11	A-4a	5	100		Mc			
	064-0	SS-2	3.0	4.5	1.5	3.0	23		4.5	24	16	8	34	19	53	14	11	A-4a	4			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	23									17	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	40	15								13	10	A-2-4	0						
65	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	27	19	8	44	22	66	16	14	A-4a	6	100					
	065-0	SS-2	3.0	4.5	1.5	3.0	15		4.5	22	16	6	33	13	46	12	11	A-4a	2						
	20	SS-3	4.5	6.0	3.0	4.5	16		4.5							16	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	34	14								11	6	A-1-a	0						
66	B	SS-1	1.5	3.0	0.0	1.5	20		4.25	25	15	10	31	14	45	15	10	A-4a	2	100		Mc			
	066-0	SS-2	3.0	4.5	1.5	3.0	12		2.5	29	18	11	41	19	60	19	14	A-6a	5			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	16		4.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	12	12								15	8	A-3a	0						
67	B	SS-1	1.5	3.0	0.0	1.5	14		3.25	24	14	10	20	10	30	14	10	A-2-4	0	100		N_{60} & Mc		**12"**	
	067-0	SS-2	3.0	4.5	1.5	3.0	5		3.5	24	16	8	21	12	33	13	10	A-2-4	0			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	11		2.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	16	5	1.75							19	16	A-6b	16						
68	B	SS-1	1.5	3.0	0.0	1.5	34									9	8	A-3a	0	830					
	068-0	SS-2	3.0	4.5	1.5	3.0	27			NP	NP	NP	22	4	26	7	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	23									7	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	22	22								8	8	A-3a	0						
69	B	SS-1	1.5	3.0	0.0	1.5	16									11	10	A-2-4	0	100					
	069-0	SS-2	3.0	4.5	1.5	3.0	25			21	16	5	22	7	29	11	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	12									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	12	12								14	10	A-2-4	0						
70	B	SS-1	1.5	3.0	0.0	1.5	22		4.5	25	17	8	31	14	45	13	12	A-4a	2	100					
	070-0	SS-2	3.0	4.5	1.5	3.0	14		2.5	30	19	11	50	22	72	18	14	A-6a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		2.5							17	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	7	7								17	10	A-2-4	0						
71	B	SS-1	1.5	3.0	0.0	1.5	8		2.5							17	10	A-4a	8	100		N_{60} & Mc		**12"**	
	071-0	SS-2	3.0	4.5	1.5	3.0	7		0.25	26	18	8	34	16	50	18	13	A-4a	3			HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10									14	10	A-2-6	4						
		SS-4	6.0	7.5	4.5	6.0	7	7								15	10	A-2-6	4						
72	B	SS-1	1.5	3.0	0.0	1.5	61			NP	NP	NP	15	4	19	11	6	A-1-b	0	280					
	072-0	SS-2	3.0	4.5	1.5	3.0	15									18	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	26		4.5	23	14	9	29	17	46	12	10	A-4a	2						
		SS-4	6.0	7.5	4.5	6.0	19	15	4.5							10	10	A-4a	8						

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Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
73	B	SS-1	2.5	4.0	1.0	2.5	14		4.5	26	16	10	28	20	48	14	11	A-4a	3			N_{60} & Mc		12"	
	073-0	SS-2	5.0	6.5	3.5	5.0	11		2.5							22	10	A-4a	8						
	20																								
								11																	
74	B	SS-1	1.5	3.0	0.0	1.5	10									8	8	A-3a	0	130					
	074-0	SS-2	3.0	4.5	1.5	3.0	12		3	22	15	7	25	15	40	12	10	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	8		2.75	40	24	16	41	21	62	30	19	A-6b	8						
		SS-4	6.0	7.5	4.5	6.0	10	8	1							23	10	A-4a	8						
75	B	SS-1	1.5	3.0	0.0	1.5	16			26	17	9	32	14	46	25	12	A-4a	2	310		Mc			
	075-0	SS-2	5.0	6.5	3.5	5.0	15		2.75							17	10	A-2-6	4						
	20																								
								15																	
76	B	SS-1	1.5	3.0	0.5	2.0	15		4.5	20	16	4	28	10	38	10	11	A-4a	1	100					
	076-0	SS-2	3.0	4.5	2.0	3.5	12			NP	NP	NP	41	7	48	13	11	A-4a	3						
	20	SS-3	4.5	6.0	3.5	5.0	11									13	10	A-4a	8						
		SS-4	6.0	7.5	5.0	6.5	11	11								9	10	A-4a	8						
77	B	SS-1	2.5	4.0	1.5	3.0	15			25	18	7	20	9	29	11	10	A-2-4	0						
	077-0	SS-2A	5.0	5.8	4.0	4.8	18									14	10	A-2-4	0						
	20	SS-2B	5.8	6.5	4.8	5.5	18		3							20	14	A-6a	10						
								15																	
78	B	SS-1	1.5	3.0	0.5	2.0	18		4.5	35	20	15	45	37	82	19	15	A-6a	10	100		Mc			
	078-0	SS-2	3.0	4.5	2.0	3.5	18		4.5	32	20	12	45	31	76	17	15	A-6a	9						
	20	SS-3	4.5	6.0	3.5	5.0	25		4.5							19	14	A-6a	10						
		SS-4	6.0	7.5	5.0	6.5	26	18	4.5							20	16	A-6b	16						
79	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	25	16	9	38	22	60	12	11	A-4a	5	310					
	079-0	SS-2	3.0	4.5	1.5	3.0	12		4	29	18	11	43	31	74	19	14	A-6a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		3							23	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	15	10	2.5							21	14	A-6a	10						
80	B	SS-1	1.5	3.0	0.0	1.5	14									3	8	A-3a	0	100					
	080-0	SS-2	3.0	4.5	1.5	3.0	20			NP	NP	NP	16	6	22	6	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	19			NP	NP	NP	28	10	38	11	11	A-4a	1						
		SS-4	6.0	7.5	4.5	6.0	18	14								11	10	A-4a	8						
81	B	SS-1	1.5	3.0	0.0	1.5	16									10	8	A-3a	0	100					
	081-0	SS-2	3.0	4.5	1.5	3.0	16			NP	NP	NP	23	10	33	8	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	18		4.5	35	20	15	49	38	87	19	15	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	19	16	4.5							21	14	A-6a	10						

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Subgrade Analysis

V. 14.5 1/18/2019

#	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	
82	B	SS-1	1.5	3.0	0.0	1.5	19			NP	NP	NP	10	3	13	5	6	A-1-b	0	130					
	082-0	SS-2	3.0	4.5	1.5	3.0	15			NP	NP	NP	7	2	9	6	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	20									6	6	A-1-b	0						
		SS-4	6.0	7.5	4.5	6.0	19	15								8	6	A-1-b	0						
83	B	SS-1	1.5	3.0	0.0	1.5	26																		
	083-0	SS-2	3.0	4.5	1.5	3.0	18			NP	NP	NP	28	8	36	11	11	A-4a	0						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.5	23	16	7	24	11	35	10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	25	18	4.25							14	10	A-2-4	0						
84	B	SS-1	1.5	3.0	0.0	1.5	19		3	32	18	14	36	33	69	17	14	A-6a	8	100		Mc			
	084-0	SS-2	3.0	4.5	1.5	3.0	10		3.75							16	14	A-6a	10			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	20		3.5	30	19	11	39	19	58	17	14	A-6a	5						
		SS-4	6.0	7.5	4.5	6.0	16	10	3							20	14	A-6a	10						
85	B	SS-1	1.5	3.0	0.0	1.5	18		3							12	14	A-6a	10	100					
	085-0	SS-2	3.0	4.5	1.5	3.0	10		4.5	28	16	12	36	26	62	14	14	A-6a	6			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	11		0.75	69	34	35	42	48	90	17		A-7-5	20						
		SS-4	6.0	7.5	4.5	6.0	10	10	2.5							23		A-7-5	16						
86	B	SS-1	1.5	3.0	0.0	1.5	23		3.75	23	14	9	24	12	36	11	10	A-4a	0						
	086-0	SS-2	3.0	4.5	1.5	3.0	8		1.5							13	10	A-4a	8	100		HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	5		1	46	23	23	35	23	58	30	20	A-7-6	10						
		SS-4	6.0	7.5	4.5	6.0	7	5	0.75							33	18	A-7-6	16						
87	B	SS-1	1.5	3.0	0.0	1.5	11			NP	NP	NP	13	3	16	18	6	A-1-b	0	1200					
	087-0	SS-2	3.0	4.5	1.5	3.0	20		4.5	27	16	11	30	27	57	12	14	A-6a	5						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	20	11	4.5							13	14	A-6a	10						
88	B	SS-1	1.5	3.0	0.0	1.5	15			NP	NP	NP	21	9	30	9	8	A-3a	0	100					
	088-0	SS-2	3.0	4.5	1.5	3.0	16			NP	NP	NP	14	6	20	7	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	8			20	13	7	24	11	35	13	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	10	8								18	10	A-2-4	0						
89	B	SS-1	1.5	3.0	0.0	1.5	22																		
	089-0	SS-2	3.0	4.5	1.5	3.0	26		4.5	32	17	15	29	27	56	11	14	A-6a	6	110					
	20	SS-3	4.5	6.0	3.0	4.5	29		4.5	33	20	13	36	34	70	14	15	A-6a	8						
		SS-4	6.0	7.5	4.5	6.0	33	22	4.5							12	14	A-6a	10						
90	B	SS-1	1.5	3.0	0.0	1.5	18		4.5	21	16	5	30	14	44	11	11	A-4a	2						
	090-0	SS-2	3.0	4.5	1.5	3.0	10		4.5							13	10	A-4a	8	170		N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		2.25	32	18	14	35	32	67	19	14	A-6a	8						
		SS-4	6.0	7.5	4.5	6.0	16	10	1							31	14	A-6a	10						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	
91	B	SS-1	1.5	3.0	0.0	1.5	12			NP	NP	NP	18	9	27	12	10	A-2-4	0	170					
	091-0	SS-2	3.0	4.5	1.5	3.0	14									17	10	A-2-4	0			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	12		3.25	32	18	14	31	23	54	15	14	A-6a	5						
		SS-4	6.0	7.5	4.5	6.0	10	10	2							23	14	A-6a	10						
92	B	SS-1	2.5	4.0	3.5	5.0	8		4.5	30	20	10	37	25	62	15	15	A-4a	5	310					
	092-0																								
	20																								
								8																	
93	B	SS-1	2.5	4.0	4.4	5.9	33		4.5	32	18	14	32	20	52	14	14	A-6a	5	100					
	093-0																								
	20																								
								30																	
94	B	SS-1	2.5	4.0	2.6	4.1	10		3.5	35	23	12	34	18	52	20	18	A-6a	4	1800					
	095-0	SS-2	5.0	6.5	5.1	6.6	14		4.5							18	14	A-6a							
	20																								
								10																	
95	B	SS-1	2.5	4.0	3.6	5.1	11		4							12	10	A-4a	8	190					
	096-0																								
	20																								
								11																	

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 95

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	8

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	2%	HP ≤ 0.5	1%
$N_{60} < 12$	22%	0.5 < HP ≤ 1	2%
$12 \leq N_{60} < 15$	13%	1 < HP ≤ 2	6%
$N_{60} \geq 20$	36%	HP > 2	59%
M+	13%		
Rock	0%		
Unsuitable	4%		

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

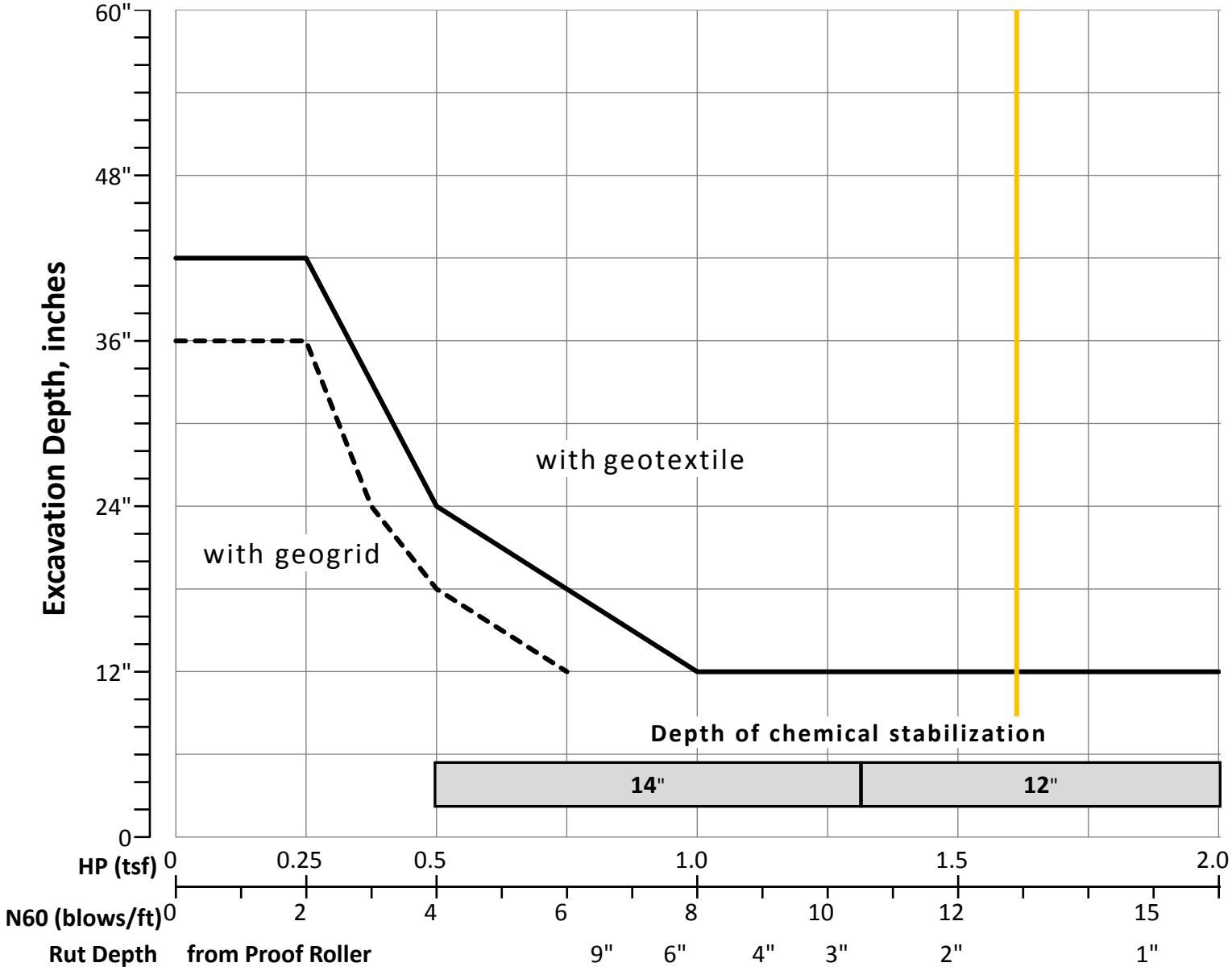
% Proposed Subgrade Surface	
Unstable & Unsuitable	35%
Unstable	32%
Unsuitable	3%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	19	13	3.66	29	18	11	32	19	51	14	12	5
Maximum	82	30	4.50	69	35	35	85	48	98	33	30	20
Minimum	3	3	0.25	18	13	3	7	2	9	3	0	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	3	3	24	38	0	8	0	2	30	111	8	0	96	26	2	10	0	0	361
Percent	1%	1%	7%	11%	0%	2%	0%	1%	8%	31%	2%	0%	27%	7%	1%	3%	0%	0%	100%
% Rock|Granular|Cohesive	1%	60%									39%								100%
Surface Class Count	1	2	18	22	0	3	0	1	17	66	6	0	49	13	0	5	0	0	203
Surface Class Percent	0%	1%	9%	11%	0%	1%	0%	0%	8%	33%	3%	0%	24%	6%	0%	2%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.66		☐ HP
12.95		☐ N60L

Average HP
Average N_{60L}

EXISTING SUBGRADE BORINGS

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
IR-77 Existing Subgrade
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
2800 Corporated Exchange Drive
Suite 240
Columbus, OH 43231
(920) 427-0671
brendan.andrews@neasinc.com

NO. OF BORINGS: 35

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-20	IR-77 NB	300+01	18	LT	CME 55X	82	1012.4	1010.9	1.5 C
2	B-002-0-20	IR-77 SB	403+91	3	LT	CME 55X	82	1012.2	1010.7	1.5 C
3	B-004-0-20	IR-77 SB	408+18	9	LT	CME 55X	82	1016.3	1014.8	1.5 C
4	B-007-0-20	IR-77 NB	315+00	41	RT	CME 45B	82	1002.0	1000.5	1.5 C
5	B-008-0-20	IR-77 SB	415+88	9	LT	CME 55X	82	1015.5	1014.0	1.5 C
6	B-009-0-20	IR-77 NB	319+10	1	LT	CME 55X	82	999.0	997.5	1.5 C
7	B-011-0-20	IR-77 NB	323+93	2	LT	CME 55X	82	995.0	993.5	1.5 C
8	B-012-0-20	IR-77 SB	424+12	9	RT	CME 55X	82	1000.6	999.1	1.5 C
9	B-014-0-20	IR-77 SB	428+74	41	LT	CME 55X	82	988.8	987.3	1.5 C
10	B-016-0-20	IR-77 SB	432+37	1	RT	CME 55X	82	981.2	979.7	1.5 C
11	B-018-0-20	IR-77 SB	436+21	0	RT	CME 55X	82	971.7	970.2	1.5 C
12	B-019-0-20	IR-77 NB	340+31	1	LT	CME 55X	82	963.9	962.4	1.5 C
13	B-020-0-20	IR-77 SB	440+21	1	RT	CME 55X	82	961.8	960.3	1.5 C
14	B-021-0-20	IR-77 NB	343+97	3	LT	CME 55X	82	955.0	953.5	1.5 C
15	B-023-0-20	IR-77 NB	348+72	6	LT	CME 55X	82	949.5	948.0	1.5 C
16	B-025-0-20	IR-77	664+36	39	RT	CME 55X	82	973.1	971.6	1.5 C
17	B-028-0-20	IR-77	676+34	39	LT	CME 55X	82	999.0	997.5	1.5 C
18	B-029-0-20	IR-77	680+33	71	RT	CME 45B	82	1001.8	1000.3	1.5 C
19	B-031-0-20	IR-77	688+28	41	RT	CME 55X	82	1006.3	1004.8	1.5 C
20	B-033-0-20	IR-77	696+54	35	RT	CME 55X	82	1009.6	1008.1	1.5 C
21	B-034-0-20	IR-77	701+52	23	LT	CME 55X	82	1014.7	1013.2	1.5 C
22	B-037-0-20	IR-77	712+59	47	RT	CME 55X	82	1044.8	1043.3	1.5 C
23	B-040-0-20	IR-77	724+53	41	LT	CME 55X	82	1080.3	1078.8	1.5 C
24	B-042-0-20	IR-77	732+51	71	LT	CME 55X	82	1104.1	1102.6	1.5 C
25	B-043-0-20	IR-77	736+56	40	RT	CME 55X	82	1116.6	1115.1	1.5 C
26	B-046-0-20	IR-77	748+52	41	LT	CME 55X	82	1152.3	1150.8	1.5 C
27	B-048-0-20	IR-77	756+55	41	LT	CME 55X	82	1170.9	1169.4	1.5 C
28	B-050-0-20	IR-77	764+57	33	LT	CME 55X	82	1178.7	1177.2	1.5 C
29	B-051-0-20	IR-77	768+59	32	RT	CME 55X	82	1181.9	1180.4	1.5 C
30	B-052-0-20	IR-77	773+45	23	LT	CME 55X	82	1183.0	1181.5	1.5 C
31	B-057-0-20	IR-77	793+08	72	RT	CME 55X	82	1164.9	1163.4	1.5 C
32	B-058-0-20	IR-77	797+10	38	LT	CME 55X	82	1161.2	1159.7	1.5 C
33	B-059-0-20	IR-77	799+87	99	RT	CME 45B	82	1158.4	1156.9	1.5 C
34	B-060-0-20	IR-77	805+10	40	LT	CME 55X	82	1160.8	1159.3	1.5 C
35	B-062-0-20	IR-77	813+15	40	LT	CME 55X	82	1164.5	1163.0	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	2.7	0.0	1.2	19			NP	NP	NP	16	6	22	8	6	A-1-b	0	100					
	001-0	SS-2	2.7	4.5	1.2	3.0	22		3.75	33	20	13	54	41	95	18	15	A-6a	9			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	25	19	4.5							15	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	10									10	8	A-3a	0	100					
	002-0	SS-2	3.0	4.5	1.5	3.0	33		4.5	30	19	11	47	23	70	15	14	A-6a	7						
	20	SS-3	4.5	6.0	3.0	4.5	22		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	10	10	2.25	34	21	13	43	36	79	18	16	A-6a	9						
3	B	SS-1	1.5	3.0	0.0	1.5	15									10	10	A-2-6	4	100					
	004-0	SS-2	3.0	4.5	1.5	3.0	26		4.25	24	15	9	25	13	38	11	10	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	10	10	2	29	17	12	31	21	52	16	12	A-4a	4						
4	B	SS-1	1.5	3.0	0.0	1.5	18		4.5	28	17	11	39	17	56	11	14	A-6a	5	150					
	007-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	27	17	10	33	19	52	12	12	A-4a	3						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.25							16	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	16	4.25							14	10	A-4a	8						
5	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	8	28	12	8	A-3a	0	100					
	008-0	SS-2	3.0	4.5	1.5	3.0	8		2.5							16	10	A-4a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	15		3	24	16	8	32	20	52	15	11	A-4a	3						
		SS-4	6.0	7.5	4.5	6.0	18	8	1.5							15	10	A-4a	8						
6	B	SS-1	1.5	3.0	0.0	1.5	15									11	10	A-2-4	0	250					
	009-0	SS-2	3.0	4.5	1.5	3.0	7		0.5	26	17	9	32	15	47	16	12	A-4a	2			HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		3.75	26	17	9	32	15	47	13	12	A-4a	2						
		SS-4	6.0	7.5	4.5	6.0	10	7	2.5							18	10	A-4a	8						
7	B	SS-1	1.5	3.0	0.0	1.5	16		1.75	25	16	9	38	26	64	15	11	A-4a	6	130		HP & Mc		12"	
	011-0	SS-2	3.0	4.5	1.5	3.0	12		2	25	16	9	27	12	39	14	11	A-4a	1			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	7		2.5							17	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	14	7	2.5							16	10	A-4a	8						
8	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	17	6	23	12	6	A-1-b	0	100					
	012-0	SS-2	3.0	4.5	1.5	3.0	11									11	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	11									13	6	A-1-b	0						
		SS-4	6.0	7.5	4.5	6.0	11	11		24	16	8	21	13	34	13	10	A-2-4	0						
9	B	SS-1	1.5	3.0	0.0	1.5	26			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	014-0	SS-2	3.0	4.5	1.5	3.0	27									12	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	14		2.25	20	13	7	24	13	37	11	10	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	19	14								16	10	A-2-4	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	016-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP				10	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	26									9	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	25	16								12	8	A-3a	0						
11	B	SS-1	1.5	3.0	0.0	1.5	16									11	10	A-4a	8	100					
	018-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP	25	11	36	8	11	A-4a	0						
	20	SS-3	4.5	6.0	3.0	4.5	23									7	6	A-1-b	0						
		SS-4A	6.0	7.2	4.5	5.7	11	11								7	6	A-1-b	0						
12	B	SS-1A	1.5	2.0	0.0	0.5	20		4							12	10	A-4a	8	100					
	019-0	SS-1B	2.0	3.0	0.5	1.5	20			NP	NP	NP	14	3	17	9	8	A-3a	0						
	20	SS-2A	3.0	4.0	1.5	2.5	27			NP	NP	NP	13	4	17	8	6	A-1-b	0						
		SS-2B	4.0	4.5	2.5	3.0	27	20	1							14	10	A-4a	8			HP & Mc			
13	B	SS-1	1.5	3.0	0.0	1.5	29									10	10	A-2-4	0	140					
	020-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	24	7	31	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	19									6	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	10	10								6	8	A-3a	0						
14	B	SS-1	1.5	3.0	0.0	1.5	19									10	8	A-3a	0	100					
	021-0	SS-2	3.0	4.5	1.5	3.0	18		3.25	21	17	4	39	12	51	17	12	A-4a	3			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									13	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	14	14	3.25	24	17	7	42	20	62	23	12	A-4a	5						
15	B	SS-1	1.5	3.0	0.0	1.5	20		4.5							20	14	A-6a	10	110		Mc			
	023-0	SS-2	3.0	4.5	1.5	3.0	15		4.5	31	20	11	37	19	56	14	15	A-6a	5						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	16	15	4.5	39	20	19	48	39	87	19	16	A-6b	12						
16	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	28	18	10	52	32	84	20	13	A-4b	8		A-4b	N_{60} & Mc		**12"**	
	025-0	SS-2	3.0	4.5	1.5	3.0	12		2.75							19	10	A-4b	8	110	A-4b	N_{60} & Mc	**36"**		
	20	SS-3	4.5	6.0	3.0	4.5	29		3.5	24	16	8	24	13	37	13	11	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	12	12	3.25							22	10	A-4a	8						
17	B	SS-1	1.5	3.0	0.0	1.5	11		4.5	22	15	7	33	22	55	13	10	A-4a	4	100		N_{60} & Mc		**12"**	
	028-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	26	17	9	42	30	72	14	12	A-4a	7						
	20	SS-3	4.5	6.0	3.0	4.5	18		3							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	23	11	2.25							15	14	A-6a	10						
18	B	SS-1	1.5	3.0	0.0	1.5	20									8	10	A-2-4	0	100					
	029-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	22	7	29	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5	19	13	6	23	9	32	12	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	26	20								6	8	A-3a	0						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	1.5	3.0	0.0	1.5	18		4.25	26	16	10	13	11	24	14	10	A-2-4	0			Mc			
	031-0	SS-2	3.0	4.5	1.5	3.0	19		2	26	17	9	46	33	79	21	12	A-4a	8			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	12		4.5							24	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	12	3							26	10	A-4a	8						
20	B	SS-1	1.5	3.0	0.0	1.5	25		4.5	32	18	14	38	30	68	13	14	A-6a	8	1400					
	033-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	28	17	11	37	24	61	12	14	A-6a	6						
	20	SS-3	4.5	6.0	3.0	4.5	16		4.5							12	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	18	16	4.5							13	14	A-6a	10						
21	B	SS-1	1.5	3.0	0.0	1.5	15		4.5	25	15	10	28	15	43	12	10	A-4a	2	310					
	034-0	SS-2	3.0	4.5	1.5	3.0	12		4.25	25	15	10	29	18	47	13	10	A-4a	2			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	15	12	4.5							17	14	A-6a	10						
22	B	SS-1	1.5	3.0	0.0	1.5	14									18	14	A-6a	10	380		N_{60} & Mc		**12"**	
	037-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	39	22	17	36	31	67	17	17	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	23		3.5	29	19	10	27	14	41	11	14	A-4a	1						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
23	B	SS-1	1.5	3.0	0.0	1.5	31		3	18	13	5	28	12	40	11	10	A-4a	1	100					
	040-0	SS-2	3.0	4.5	1.5	3.0	34			NP	NP	NP	28	13	41	10	11	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	41									9	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	33	30								9	10	A-4a	8						
24	B	SS-1	1.5	3.0	0.0	1.5	29			22	16	6	25	9	34	8	10	A-2-4	0	150					
	042-0	SS-2	3.0	4.3	1.5	2.8	50									8	0	Rock	0		Rock	Mc			
	20	SS-3	4.5	5.4	3.0	3.9	50									6	0	Rock	0						
		SS-4	6.0	6.5	4.5	5.0	50	29									0	Rock	0						
25	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	19	5	24	8	6	A-1-b	0	100					
	043-0	SS-2	3.0	4.5	1.5	3.0	27									16	10	A-2-4	0			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	18	16								11	8	A-3a	0						
26	B	SS-1	1.5	3.0	0.0	1.5	11		2.25	23	14	9	32	16	48	13	10	A-4a	3	110		N_{60} & Mc		**12"**	
	046-0	SS-2	3.0	4.5	1.5	3.0	20		4.5	27	17	10	43	24	67	14	12	A-4a	6						
	20	SS-3	4.5	6.0	3.0	4.5	18		4.5							13	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	26	11	4.5							15	10	A-4a	8						
27	B	SS-1	1.5	3.0	0.0	1.5	19									8	6	A-1-b	0	110					
	048-0	SS-2	3.0	4.5	1.5	3.0	18		4.5	34	17	17	39	29	68	15	16	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5							16	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	20	18	4.5							21	16	A-6b	16						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	3.0	0.0	1.5	31		4.5	27	18	9	25	14	39	11	13	A-4a	1	100					
	050-0	SS-2	3.0	4.5	1.5	3.0	29		4.5	36	20	16	33	20	53	11	16	A-6b	6						
	20	SS-3	4.5	6.0	3.0	4.5	31		4.5							9	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	63	29	4.5							10	16	A-6b	16						
29	B	SS-1	1.5	3.0	0.0	1.5	31		4.5							12	10	A-4a	8	100					
	051-0	SS-2	3.0	4.5	1.5	3.0	31		4.5	26	18	8	30	15	45	10	13	A-4a	2						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5	31	17	14	34	21	55	12	14	A-6a	6						
		SS-4	6.0	7.5	4.5	6.0	22	19	4.25							16	14	A-6a	10						
30	B	SS-1	1.5	3.0	0.0	1.5	16		3	25	17	8	23	10	33	10	10	A-2-4	0	100					
	052-0	SS-2	3.0	4.5	1.5	3.0	18			NP	NP	NP	10	4	14	6	6	A-1-a	0						
	20	SS-3	4.5	6.0	3.0	4.5	45									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	22	16								11	10	A-2-4	0						
31	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	36	14	50	10	11	A-4a	3	100					
	057-0	SS-2	3.0	4.5	1.5	3.0	15			NP	NP	NP	19	11	30	11	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	12									18	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	11	11	2.5							17	14	A-6a	10						
32	B	SS-1	1.5	3.0	0.0	1.5	11		4.5	29	18	11	22	14	36	12	13	A-4a	0	110		N_{60}		12"	
	058-0	SS-2	3.0	4.5	1.5	3.0	8		2.25	38	35	3	33	16	49	20	30	A-6b	3			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	5		2							15	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	7	5	3							20	16	A-6b	16						
33	B	SS-1	1.5	3.0	0.0	1.5	12		4.5	26	15	11	31	21	52	13	14	A-6a	4	110					
	059-0	SS-2	3.0	4.5	1.5	3.0	15		4.25	24	14	10	32	21	53	14	10	A-4a	4			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		2.25							18	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	10	2							20	10	A-4a	8						
34	B	SS-1	1.5	3.0	0.0	1.5	14		3.5	18	13	5	26	13	39	11	10	A-4a	1						
	060-0	SS-2	3.0	4.5	1.5	3.0	31		1.5	27	15	12	31	20	51	15	14	A-6a	4			HP			
	20	SS-3	4.5	6.0	3.0	4.5	20		4.5							10	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
35	B	SS-1	1.5	3.0	0.0	1.5	29									9	8	A-3a	0	100					
	062-0	SS-2	3.0	4.5	1.5	3.0	27		4.5	30	19	11	44	41	85	15	14	A-6a	8						
	20	SS-3	4.5	6.0	3.0	4.5	33		4.5	32	18	14	40	35	75	15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	35	27	4.5							14	14	A-6a	10						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 35

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	8

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	1%	HP ≤ 0.5	1%
$N_{60} < 12$	14%	0.5 < HP ≤ 1	1%
$12 \leq N_{60} < 15$	12%	1 < HP ≤ 2	6%
$N_{60} \geq 20$	45%	HP > 2	56%
M+	14%		
Rock	1%		
Unsuitable	4%		

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

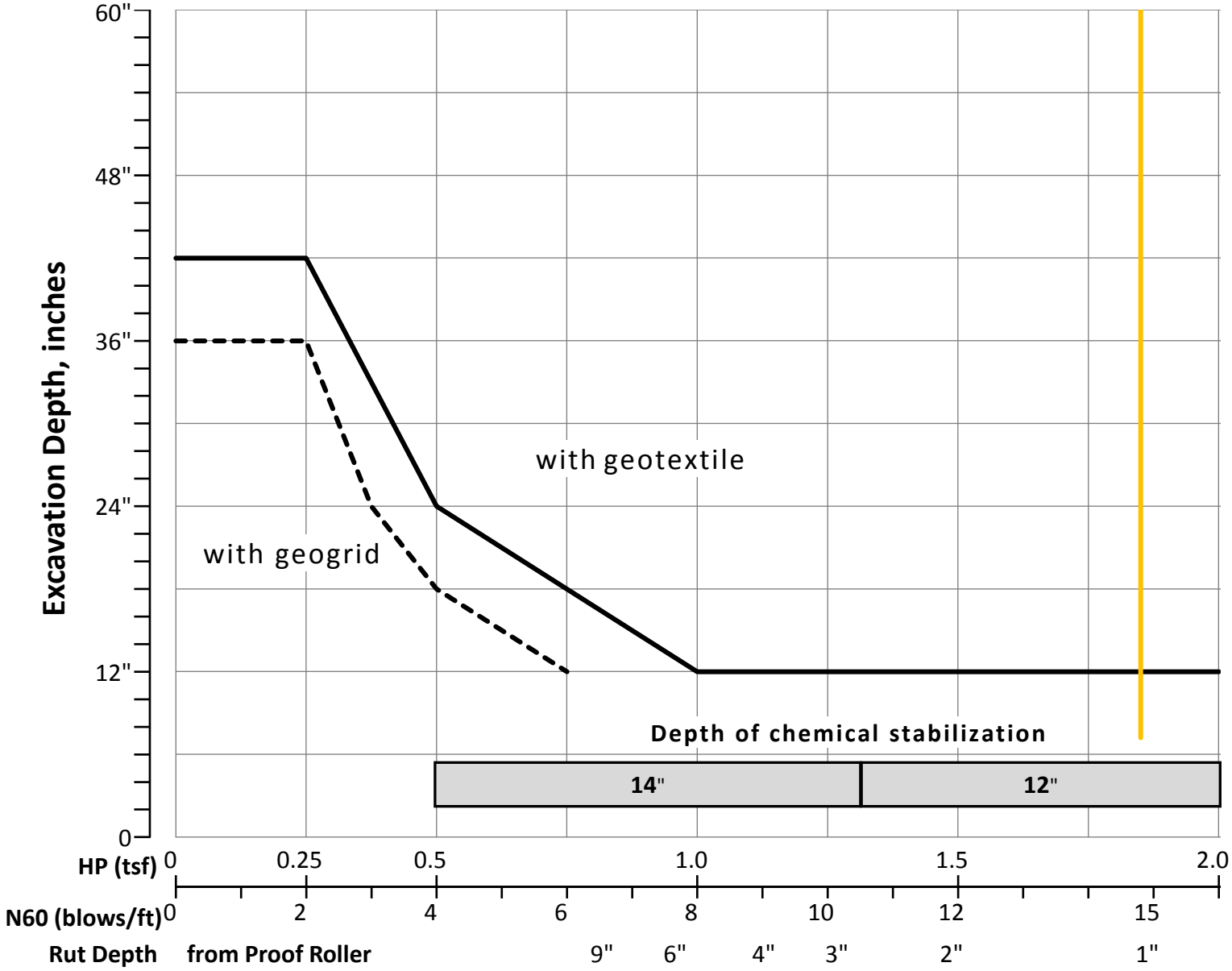
% Proposed Subgrade Surface	
Unstable & Unsuitable	35%
Unstable	31%
Unsuitable	4%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	20	15	3.67	27	17	10	30	18	48	13	11	5
Maximum	63	30	4.50	39	35	19	54	41	95	26	30	16
Minimum	5	5	0.50	18	13	3	10	3	14	6	0	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	3	1	9	18	0	1	0	0	15	53	2	0	27	11	0	0	0	0	140
Percent	2%	1%	6%	13%	0%	1%	0%	0%	11%	38%	1%	0%	19%	8%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	2%	69%									29%								100%
Surface Class Count	1	1	6	12	0	1	0	0	7	27	2	0	11	4	0	0	0	0	72
Surface Class Percent	1%	1%	8%	17%	0%	1%	0%	0%	10%	38%	3%	0%	15%	6%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.67		☐ HP
14.86		☐ N60L

Average HP
Average N_{60L}

WIDENED AREA BORINGS

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
IR-77 Widened Area
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
2800 Corporated Exchange Drive
Suite 240
Columbus, OH 43231
(920) 427-0671
brendan.andrews@neasinc.com

NO. OF BORINGS: 32

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-003-0-20	IR-77 NB	307+04	16	LT	CME 55X	82	1007.0	1007.6	0.6 F
2	B-005-0-20	IR-77 NB	310+99	15	LT	CME 55X	82	1006.1	1004.6	1.5 C
3	B-006-0-20	IR-77 SB	411+96	6	RT	CME 55X	82	1015.9	1015.5	0.4 C
4	B-010-0-20	IR-77 SB	419+97	15	RT	CME 55X	82	1008.2	1008.3	0.1 F
5	B-013-0-20	IR-77 NB	328+78	16	LT	CME 55X	82	988.5	988.0	0.5 C
6	B-015-0-20	IR-77 NB	332+00	16	LT	CME 55X	82	982.8	982.1	0.7 C
7	B-017-0-20	IR-77 NB	336+02	13	LT	CME 55X	82	972.9	972.4	0.5 C
8	B-022-0-20	IR-77 SB	443+14	12	RT	CME 55X	82	954.4	953.9	0.5 C
9	B-024-0-20	IR-77	660+27	14	LT	CME 55X	82	962.0	961.6	0.4 C
10	B-026-0-20	IR-77	668+28	33	LT	CME 55X	82	982.2	981.2	1.0 C
11	B-027-0-20	IR-77	672+27	30	RT	CME 55X	82	990.9	990.9	0.0 F
12	B-030-0-20	IR-77	684+31	29	LT	CME 55X	82	1002.6	1002.4	0.2 C
13	B-032-0-20	IR-77	692+52	26	LT	CME 55X	82	1007.1	1006.4	0.7 C
14	B-035-0-20	IR-77	705+15	25	RT	CME 55X	82	1021.6	1020.5	1.1 C
15	B-036-0-20	IR-77	708+46	32	LT	CME 55X	82	1031.1	1030.5	0.6 C
16	B-038-0-20	IR-77	716+54	34	LT	CME 55X	82	1055.8	1055.0	0.8 C
17	B-039-0-20	IR-77	720+49	34	RT	CME 55X	82	1067.4	1066.7	0.7 C
18	B-041-0-20	IR-77	728+54	33	RT	CME 55X	82	1091.5	1090.9	0.6 C
19	B-044-0-20	IR-77	740+56	34	LT	CME 55X	82	1127.6	1127.0	0.6 C
20	B-045-0-20	IR-77	744+53	32	RT	CME 55X	82	1139.4	1139.1	0.3 C
21	B-047-0-20	IR-77	752+52	32	RT	CME 55X	82	1162.3	1161.6	0.7 C
22	B-049-0-20	IR-77	760+56	31	RT	CME 55X	82	1174.8	1174.1	0.7 C
23	B-053-0-20	IR-77	777+09	19	RT	CME 55X	82	1179.2	1179.2	0.0 F
24	B-054-0-20	IR-77	781+04	27	LT	CME 55X	82	1176.1	1175.3	0.8 C
25	B-055-0-20	IR-77	784+58	35	RT	CME 55X	82	1173.2	1171.8	1.4 C
26	B-056-0-20	IR-77	789+10	34	LT	CME 55X	82	1168.1	1167.5	0.6 C
27	B-061-0-20	IR-77	809+75	34	RT	CME 55X	82	1162.0	1161.5	0.5 C
28	B-063-0-20	IR-77	816+93	27	RT	CME 55X	82	1165.0	1164.7	0.3 C
29	B-092-0-20	IR-77 SB	413+49	12	RT	CME 55X	82	1014.1	1015.1	1.0 F
30	B-093-0-20	IR-77 SB	416+09	22	RT	CME 55X	82	1011.3	1013.2	1.9 F
31	B-095-0-20	IR-77 NB	313+26	16	LT	CME 55X	82	1002.2	1002.3	0.1 F
32	B-096-0-20	IR-77 NB	316+24	25	LT	CME 55X	82	998.9	1000.0	1.1 F

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	0.0	1.5	0.6	2.1	12			NP	NP	NP	21	6	27	8	8	A-3a	0	100					
	003-0	SS-2	1.5	3.0	2.1	3.6	11									10	8	A-3a	0						
	20	SS-3	3.0	4.5	3.6	5.1	7									9	8	A-3a	0						
		SS-4	4.5	6.0	5.1	6.6	7	7	1.5	25	18	7	50	25	75	23	13	A-4b							
2	B	SS-2	1.5	3.0	0.0	1.5	16			NP	NP	NP	13	3	16	8	6	A-1-b	0	100					
	005-0	SS-3	3.0	4.5	1.5	3.0	16									8	6	A-1-b	0						
	20	SS-4	4.5	6.0	3.0	4.5	8		1.5							25	10	A-4a	8						
								8																	
3	B	SS-1	0.0	1.5	-0.4	1.1	25		4.5	28	20	8	31	16	47	11	15	A-4a	2	100					
	006-0	SS-2	1.5	3.0	1.1	2.6	8									17	10	A-4a	8			N_{60} & Mc		12"	
	20	SS-3	3.0	4.5	2.6	4.1	7		4.25	29	17	12	40	27	67	16	14	A-6a	7						
		SS-4	4.5	6.0	4.1	5.6	14	7	4.25							16	14	A-6a	10						
4	B	SS-1	0.0	1.5	0.1	1.6	23		4.5	28	17	11	37	21	58	11	14	A-6a	5	170					
	010-0	SS-2	1.5	3.0	1.6	3.1	38		4.5	28	15	13	25	17	42	13	14	A-6a	2						
	20	SS-3	3.0	4.5	3.1	4.6	22		4.5							15	14	A-6a	10						
		SS-4	4.5	6.0	4.6	6.1	14	14	4.5							14	14	A-6a	10						
5	B	SS-1	0.0	1.5	-0.5	1.0	15			NP	NP	NP	22	10	32	11	10	A-2-4	0	110					
	013-0	SS-2	1.5	3.0	1.0	2.5	31		4.5	29	19	10	50	36	86	18	14	A-4b	8		A-4b	Mc	30"		
	20	SS-3	3.0	4.5	2.5	4.0	30		4.5							18	10	A-4b	8						
		SS-4	4.5	6.0	4.0	5.5	18	15	4.5							14	10	A-4b	8						
6	B	SS-1	0.0	1.5	-0.7	0.8	20									8	6	A-1-b	0	100					
	015-0	SS-2	1.5	3.0	0.8	2.3	34			NP	NP	NP	13	3	16	6	6	A-1-b	0						
	20	SS-3	3.0	4.5	2.3	3.8	20									10	6	A-1-b	0						
		SS-4	4.5	6.0	3.8	5.3	16	16								7	6	A-1-b	0						
7	B	SS-1	0.0	1.5	-0.5	1.0	11			NP	NP	NP	14	12	26	12	8	A-3a	0	100					
	017-0	SS-2	1.5	3.0	1.0	2.5	14			35	19	16	13	12	25	15	10	A-2-6	1			N_{60} & Mc		12"	
	20	SS-3	3.0	4.5	2.5	4.0	10									15	10	A-2-6	4						
		SS-4	4.5	6.0	4.0	5.5	4	4								16	10	A-2-6	4						
8	B	SS-1	0.0	1.5	-0.5	1.0	10		3	27	17	10	30	17	47	12	12	A-4a	2	120		N_{60}		12"	
	022-0	SS-2	1.5	3.0	1.0	2.5	25		4.5							11	10	A-4a	8						
	20	SS-3	3.0	4.5	2.5	4.0	19		4.5							12	10	A-4a	8						
		SS-4	4.5	6.0	4.0	5.5	12	10	4.5	31	17	14	37	30	67	14	12	A-4a	8						
9	B	SS-1A	0.0	1.0	-0.4	0.6	82		4.5							10	6	A-1-b	0	2000					
	024-0	SS-2	1.0	3.0	0.6	2.6	35		4.5	30	18	12	41	31	72	15	14	A-6a	8						
	20	SS-3	3.0	4.5	2.6	4.1	18		4.5	35	19	16	41	36	77	17	16	A-6b	10						
		SS-4	4.5	6.0	4.1	5.6	19	18	4.5							18	16	A-6b	16						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	0.0	1.5	-1.0	0.5	11		4.5	23	16	7	33	21	54	11	11	A-4a	4	110		N_{60}		12"	
	026-0	SS-2	1.5	3.5	0.5	2.5	38		3.5	25	19	6	75	23	98	26	14	A-4b	8		A-4b	Mc	30"		
	20	SS-3B	3.5	4.5	2.5	3.5	20									10	8	A-3	0						
		SS-4	4.5	6.0	3.5	5.0	20	11								10	8	A-3	0						
11	B	SS-1	0.0	1.5	0.0	1.5	14			NP	NP	NP	28	13	41	10	11	A-4a	1	100					
	027-0	SS-2	1.5	3.0	1.5	3.0	16			NP	NP	NP	85	12	97	25	11	A-4b	8		A-4b	Mc			
	20	SS-3	3.0	4.5	3.0	4.5	14									15	8	A-3a	0						
		SS-4	4.5	6.0	4.5	6.0	10	10								22	10	A-4a	8						
12	B	SS-1	0.0	1.5	-0.2	1.3	15		4.5	28	18	10	36	22	58	12	13	A-4a	5	5500					
	030-0	SS-2	1.5	3.0	1.3	2.8	26		4.5	28	17	11	38	28	66	12	14	A-6a	7						
	20	SS-3	3.0	4.5	2.8	4.3	19		4.5							13	14	A-6a	10						
		SS-4	4.5	6.0	4.3	5.8	12	12	4.25							14	14	A-6a	10						
13	B	SS-1	0.7	1.5	0.0	0.8	5		2.25	32	20	12	36	20	56	17	15	A-6a	5	100		N_{60}		21"	12"
	032-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	33	18	15	43	32	75	15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	22		4.5							15	10	A-4a	8						
		SS-4	4.5	6.0	3.8	5.3	11	5	4							20	10	A-4a	8						
14	B	SS-1	0.0	1.5	-1.1	0.4	10		4.5	32	18	14	38	23	61	16	14	A-6a	7	190		N_{60}		12"	
	035-0	SS-2	1.5	3.0	0.4	1.9	25		4.5	31	19	12	30	20	50	12	14	A-6a	4						
	20	SS-3	3.0	4.5	1.9	3.4	27		1.5							24	14	A-6a	10			HP & Mc			
		SS-4	4.5	6.0	3.4	4.9	14	10	3							16	14	A-6a	10						
15	B	SS-1	0.0	1.5	-0.6	0.9	10		4.5	26	17	9	28	15	43	15	12	A-4a	2	100		N_{60} & Mc		12"	
	036-0	SS-2	1.5	3.0	0.9	2.4	22		4.5	34	18	16	40	27	67	15	16	A-6b	9						
	20	SS-3	3.0	4.5	2.4	3.9	23		4.5							18	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	18	10	4.5	34	19	15	37	20	57	12	14	A-6a	6						
16	B	SS-1	0.0	1.5	-0.8	0.8	10		4.5	31	19	12	36	20	56	13	14	A-6a	5	160		N_{60}		12"	
	038-0	SS-2	1.5	3.0	0.8	2.3	27		4.5							15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	15		4.5							14	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	26	10	4.5	30	19	11	43	32	75	13	14	A-6a	8						
17	B	SS-1	0.0	1.5	-0.7	0.8	11		4.5	30	17	13	39	25	64	13	14	A-6a	7	230		N_{60}		12"	
	039-0	SS-2	1.5	3.0	0.8	2.3	38		4.5							11	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	18		4.5							12	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	18	11	4.5	22	15	7	31	14	45	12	10	A-4a	2						
18	B	SS-1	0.0	1.5	-0.6	0.9	30									7	10	A-2-4	0	100					
	041-0	SS-2	1.5	2.0	0.9	1.4	50									7	6	A-1-a	0						
	20	SS-3	3.0	4.5	2.4	3.9	52		4.25	41	25	16	33	12	45	13	22	A-7-6	4						
		SS-4	4.5	6.0	3.9	5.4	66	30	4.5							8	18	A-7-6	16						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	0.0	1.5	-0.6	0.9	7		4.5	29	21	8	38	21	59	14	16	A-4a	5	100		N_{60}		15"	
	044-0	SS-2	1.5	3.0	0.9	2.4	11		4.25	25	18	7	42	20	62	15	13	A-4a	5			N_{60}		12"	
	20	SS-3	3.0	4.5	2.4	3.9	3									23	10	A-4a	8						
		SS-4	4.5	6.0	3.9	5.4	22	3								12	10	A-2-6	4						
20	B	SS-1	0.0	1.5	-0.3	1.2	15		4.5	25	18	7	33	19	52	13	13	A-4a	3	170					
	045-0	SS-2	1.5	3.0	1.2	2.7	15		4.25	21	15	6	33	16	49	12	10	A-4a	3						
	20	SS-3	3.0	4.5	2.7	4.2	11		2.5							13	10	A-4a	8						
		SS-4	4.5	6.0	4.2	5.7	19	11	4.5							12	10	A-4a	8						
21	B	SS-1	0.0	1.5	-0.7	0.8	16		4.5	25	16	9	34	22	56	11	11	A-4a	4						
	047-0	SS-2	1.5	3.0	0.8	2.3	45		4.5							13	10	A-4a	8	110		Mc			
	20	SS-3	3.0	4.5	2.3	3.8	20		4.5	34	19	15	37	42	79	18	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	16	16	3							17	14	A-6a	10						
22	B	SS-1	0.0	1.5	-0.7	0.8	14		3.75	39	20	19	34	24	58	17	16	A-6b	8	490					
	049-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	41	20	21	44	33	77	19	18	A-7-6	13						
	20	SS-3	3.0	4.5	2.3	3.8	16		4.25							17	18	A-7-6	16						
		SS-4	4.5	6.0	3.8	5.3	12	12	3.75							19	18	A-7-6	16						
23	B	SS-1	0.0	1.5	0.0	1.5	7		4	36	22	14	31	18	49	17	17	A-6a	4	100		N_{60}		15"	
	053-0	SS-2	1.5	3.0	1.5	3.0	15		4.5	34	21	13	47	28	75	19	16	A-6a	9			Mc			
	20	SS-3	3.0	4.5	3.0	4.5	20		4.5							23	14	A-6a	10						
		SS-4	4.5	6.0	4.5	6.0	23	7	4.5							16	14	A-6a	10						
24	B	SS-1	0.0	1.5	-0.8	0.7	8		2.5	35	20	15	28	17	45	15	15	A-6a	4	100		N_{60}		12"	
	054-0	SS-2	1.5	3.0	0.7	2.2	23		4.5	28	18	10	44	29	73	15	13	A-4a	8						
	20	SS-3	3.0	4.5	2.2	3.7	15		2.75							16	10	A-4a	8						
		SS-4	4.5	6.0	3.7	5.2	15	8	2.25							16	10	A-4a	8						
25	B	SS-1	0.0	1.5	-1.4	0.1	10		1.5	39	22	17	31	24	55	20	17	A-6b	7	120		HP & Mc		12"	
	055-0	SS-2	1.5	3.0	0.1	1.6	15		4.5	37	20	17	40	47	87	18	16	A-6b	11						
	20	SS-3	3.0	4.5	1.6	3.1	22		3.25							18	16	A-6b	16						
		SS-4	4.5	6.0	3.1	4.6	15	10	1.75							14	16	A-6b	16						
26	B	SS-1	0.0	1.5	-0.6	0.9	14		2.5	30	17	13	39	25	64	14	14	A-6a	7	350					
	056-0	SS-2	1.5	3.0	0.9	2.4	19		3.75	37	20	17	37	23	60	17	16	A-6b	8						
	20	SS-3	3.0	4.5	2.4	3.9	23		2.75							16	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	14	14	3							14	16	A-6b	16						
27	B	SS-1	0.0	1.5	-0.5	1.0	8		2	38	27	11	28	17	45	15	22	A-6a	2	100		N_{60}		12"	
	061-0	SS-2	1.5	3.0	1.0	2.5	11		2	42	30	12	32	18	50	20	25	A-6a	4			N_{60}		12"	
	20	SS-3	3.0	4.5	2.5	4.0	11		2.5							19	14	A-6a	10						
		SS-4	4.5	6.0	4.0	5.5	19	8	4.5							13	10	A-4a	8						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	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	0.0	1.5	-0.3	1.2	11		2.25	30	17	13	29	24	53	17	14	A-6a	5	140		N_{60} & Mc		**12"**	
	063-0	SS-2	1.5	3.0	1.2	2.7	8		2.25	43	21	22	38	47	85	23	18	A-7-6	13			N_{60} & Mc			
	20	SS-3	3.0	4.5	2.7	4.2	15		1.5							24	18	A-7-6	16						
		SS-4	4.5	6.0	4.2	5.7	18	8	1.75							28	18	A-7-6	16						
29	B	SS-1	2.5	4.0	3.5	5.0	8		4.5	30	20	10	37	25	62	15	15	A-4a	5	310					
	092-0																								
	20																								
								8																	
30	B	SS-1	2.5	4.0	4.4	5.9	33		4.5	32	18	14	32	20	52	14	14	A-6a	5	100					
	093-0																								
	20																								
								30																	
31	B	SS-1	2.5	4.0	2.6	4.1	10		3.5	35	23	12	34	18	52	20	18	A-6a	4	1800					
	095-0	SS-2	5.0	6.5	5.1	6.6	14		4.5							18	14	A-6a							
	20																								
								10																	
32	B	SS-1	2.5	4.0	3.6	5.1	11		4							12	10	A-4a	8	190					
	096-0																								
	20																								
								11																	

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 32

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	7

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	3%	HP ≤ 0.5	0%
$N_{60} < 12$	28%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	12%	1 < HP ≤ 2	8%
$N_{60} \geq 20$	34%	HP > 2	71%
M+	10%		
Rock	0%		
Unsuitable	5%		

Excavate and Replace at Surface	
Average	0''
Maximum	12''
Minimum	0''

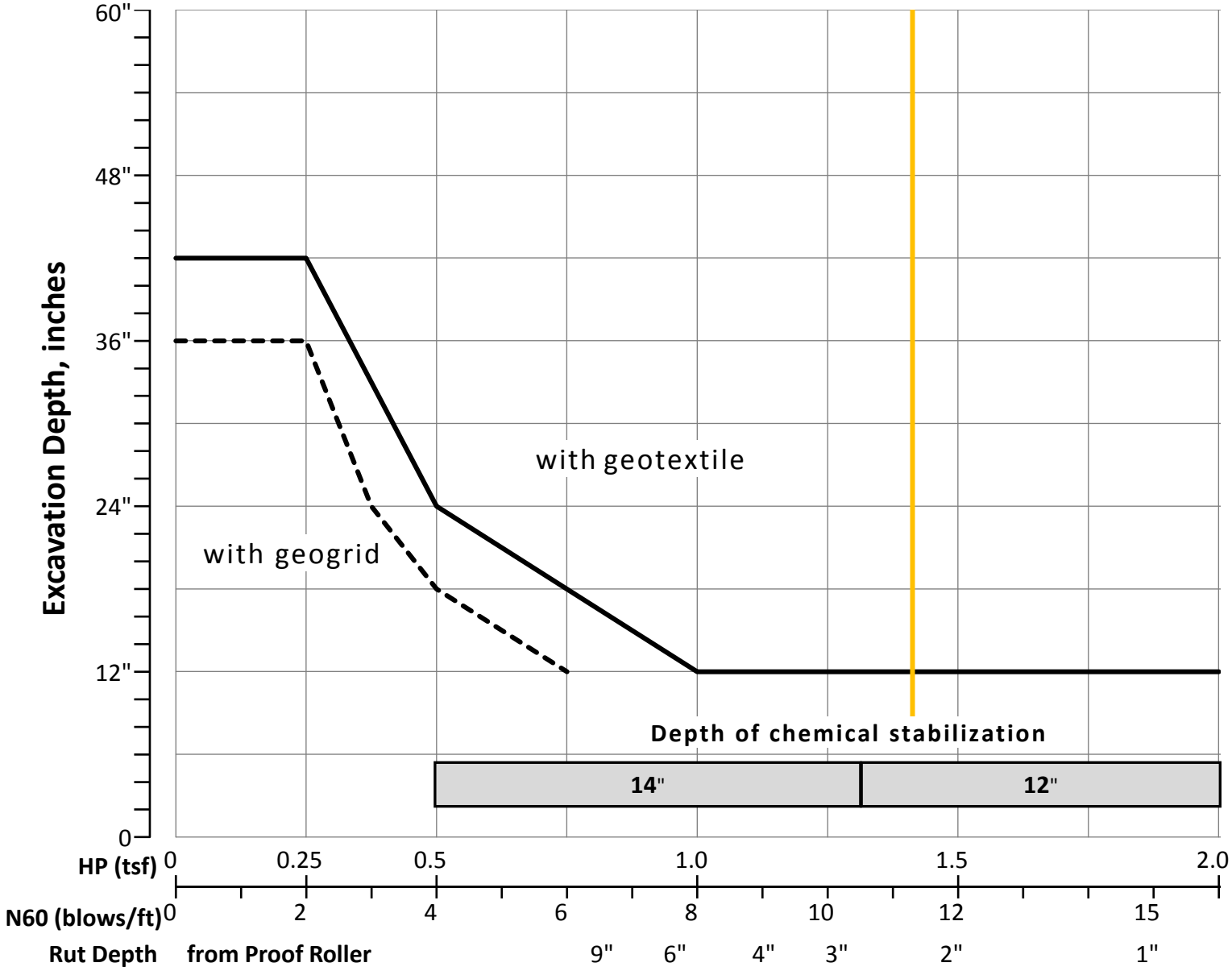
% Proposed Subgrade Surface	
Unstable & Unsuitable	34%
Unstable	30%
Unsuitable	4%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	19	11	3.83	31	19	12	36	22	58	15	13	7
Maximum	82	30	4.50	43	30	22	85	47	98	28	25	16
Minimum	3	3	1.50	21	15	6	13	3	16	6	6	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	1	7	2	0	4	0	2	5	30	6	0	39	12	0	8	0	0	116
Percent	0%	1%	6%	2%	0%	3%	0%	2%	4%	26%	5%	0%	34%	10%	0%	7%	0%	0%	100%
% Rock|Granular|Cohesive	0%	44%									56%								100%
Surface Class Count	0	1	6	2	0	2	0	1	3	20	4	0	27	9	0	5	0	0	80
Surface Class Percent	0%	1%	8%	3%	0%	3%	0%	1%	4%	25%	5%	0%	34%	11%	0%	6%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.83		☐ HP
11.38		☐ N60L

Average HP
Average N_{60L}

IR-77

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
IR-77
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
2800 Corporated Exchange Drive
Suite 240
Columbus, OH 43231
(920) 427-0671
brendan.andrews@neasinc.com

NO. OF BORINGS: 63

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-20	IR-77 NB	300+01	18	LT	CME 55X	82	1012.4	1010.9	1.5 C
2	B-002-0-20	IR-77 SB	403+91	3	LT	CME 55X	82	1012.2	1010.7	1.5 C
3	B-003-0-20	IR-77 NB	307+04	16	LT	CME 55X	82	1007.0	1007.6	0.6 F
4	B-004-0-20	IR-77 SB	408+18	9	LT	CME 55X	82	1016.3	1014.8	1.5 C
5	B-005-0-20	IR-77 NB	310+99	15	LT	CME 55X	82	1006.1	1004.6	1.5 C
6	B-006-0-20	IR-77 SB	411+96	6	RT	CME 55X	82	1015.9	1015.5	0.4 C
7	B-007-0-20	IR-77 NB	315+00	41	RT	CME 45B	82	1002.0	1000.5	1.5 C
8	B-008-0-20	IR-77 SB	415+88	9	LT	CME 55X	82	1015.5	1014.0	1.5 C
9	B-009-0-20	IR-77 NB	319+10	1	LT	CME 55X	82	999.0	997.5	1.5 C
10	B-010-0-20	IR-77 SB	419+97	15	RT	CME 55X	82	1008.2	1008.3	0.1 F
11	B-011-0-20	IR-77 NB	323+93	2	LT	CME 55X	82	995.0	993.5	1.5 C
12	B-012-0-20	IR-77 SB	424+12	9	RT	CME 55X	82	1000.6	999.1	1.5 C
13	B-013-0-20	IR-77 NB	328+78	16	LT	CME 55X	82	988.5	988.0	0.5 C
14	B-014-0-20	IR-77 SB	428+74	41	LT	CME 55X	82	988.8	987.3	1.5 C
15	B-015-0-20	IR-77 NB	332+00	16	LT	CME 55X	82	982.8	982.1	0.7 C
16	B-016-0-20	IR-77 SB	432+37	1	RT	CME 55X	82	981.2	979.7	1.5 C
17	B-017-0-20	IR-77 NB	336+02	13	LT	CME 55X	82	972.9	972.4	0.5 C
18	B-018-0-20	IR-77 SB	436+21	0	RT	CME 55X	82	971.7	970.2	1.5 C
19	B-019-0-20	IR-77 NB	340+31	1	LT	CME 55X	82	963.9	962.4	1.5 C
20	B-020-0-20	IR-77 SB	440+21	1	RT	CME 55X	82	961.8	960.3	1.5 C
21	B-021-0-20	IR-77 NB	343+97	3	LT	CME 55X	82	955.0	953.5	1.5 C
22	B-022-0-20	IR-77 SB	443+14	12	RT	CME 55X	82	954.4	953.9	0.5 C
23	B-023-0-20	IR-77 NB	348+72	6	LT	CME 55X	82	949.5	948.0	1.5 C
24	B-024-0-20	IR-77	660+27	14	LT	CME 55X	82	962.0	961.6	0.4 C
25	B-025-0-20	IR-77	664+36	39	RT	CME 55X	82	973.1	971.6	1.5 C
26	B-026-0-20	IR-77	668+28	33	LT	CME 55X	82	982.2	981.2	1.0 C
27	B-027-0-20	IR-77	672+27	30	RT	CME 55X	82	990.9	990.9	0.0 F
28	B-028-0-20	IR-77	676+34	39	LT	CME 55X	82	999.0	997.5	1.5 C
29	B-029-0-20	IR-77	680+33	71	RT	CME 45B	82	1001.8	1000.3	1.5 C
30	B-030-0-20	IR-77	684+31	29	LT	CME 55X	82	1002.6	1002.4	0.2 C
31	B-031-0-20	IR-77	688+28	41	RT	CME 55X	82	1006.3	1004.8	1.5 C
32	B-032-0-20	IR-77	692+52	26	LT	CME 55X	82	1007.1	1006.4	0.7 C
33	B-033-0-20	IR-77	696+54	35	RT	CME 55X	82	1009.6	1008.1	1.5 C
34	B-034-0-20	IR-77	701+52	23	LT	CME 55X	82	1014.7	1013.2	1.5 C
35	B-035-0-20	IR-77	705+15	25	RT	CME 55X	82	1021.6	1020.5	1.1 C
36	B-036-0-20	IR-77	708+46	32	LT	CME 55X	82	1031.1	1030.5	0.6 C
37	B-037-0-20	IR-77	712+59	47	RT	CME 55X	82	1044.8	1043.3	1.5 C
38	B-038-0-20	IR-77	716+54	34	LT	CME 55X	82	1055.8	1055.0	0.8 C
39	B-039-0-20	IR-77	720+49	34	RT	CME 55X	82	1067.4	1066.7	0.7 C
40	B-040-0-20	IR-77	724+53	41	LT	CME 55X	82	1080.3	1078.8	1.5 C
41	B-041-0-20	IR-77	728+54	33	RT	CME 55X	82	1091.5	1090.9	0.6 C
42	B-042-0-20	IR-77	732+51	71	LT	CME 55X	82	1104.1	1102.6	1.5 C
43	B-043-0-20	IR-77	736+56	40	RT	CME 55X	82	1116.6	1115.1	1.5 C
44	B-044-0-20	IR-77	740+56	34	LT	CME 55X	82	1127.6	1127.0	0.6 C
45	B-045-0-20	IR-77	744+53	32	RT	CME 55X	82	1139.4	1139.1	0.3 C

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
46	B-046-0-20	IR-77	748+52	41	LT	CME 55X	82	1152.3	1150.8	1.5 C
47	B-047-0-20	IR-77	752+52	32	RT	CME 55X	82	1162.3	1161.6	0.7 C
48	B-048-0-20	IR-77	756+55	41	LT	CME 55X	82	1170.9	1169.4	1.5 C
49	B-049-0-20	IR-77	760+56	31	RT	CME 55X	82	1174.8	1174.1	0.7 C
50	B-050-0-20	IR-77	764+57	33	LT	CME 55X	82	1178.7	1177.2	1.5 C
51	B-051-0-20	IR-77	768+59	32	RT	CME 55X	82	1181.9	1180.4	1.5 C
52	B-052-0-20	IR-77	773+45	23	LT	CME 55X	82	1183.0	1181.5	1.5 C
53	B-053-0-20	IR-77	777+09	19	RT	CME 55X	82	1179.2	1179.2	0.0 F
54	B-054-0-20	IR-77	781+04	27	LT	CME 55X	82	1176.1	1175.3	0.8 C
55	B-055-0-20	IR-77	784+58	35	RT	CME 55X	82	1173.2	1171.8	1.4 C
56	B-056-0-20	IR-77	789+10	34	LT	CME 55X	82	1168.1	1167.5	0.6 C
57	B-057-0-20	IR-77	793+08	72	RT	CME 55X	82	1164.9	1163.4	1.5 C
58	B-058-0-20	IR-77	797+10	38	LT	CME 55X	82	1161.2	1159.7	1.5 C
59	B-059-0-20	IR-77	799+87	99	RT	CME 45B	82	1158.4	1156.9	1.5 C
60	B-060-0-20	IR-77	805+10	40	LT	CME 55X	82	1160.8	1159.3	1.5 C
61	B-061-0-20	IR-77	809+75	34	RT	CME 55X	82	1162.0	1161.5	0.5 C
62	B-062-0-20	IR-77	813+15	40	LT	CME 55X	82	1164.5	1163.0	1.5 C
63	B-063-0-20	IR-77	816+93	27	RT	CME 55X	82	1165.0	1164.7	0.3 C

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Subgrade Analysis

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1A	1.5	2.7	0.0	1.2	19			NP	NP	NP	16	6	22	8	6	A-1-b	0	100					
	001-0	SS-2	2.7	4.5	1.2	3.0	22		3.75	33	20	13	54	41	95	18	15	A-6a	9			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	25	19	4.5							15	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	10									10	8	A-3a	0	100					
	002-0	SS-2	3.0	4.5	1.5	3.0	33		4.5	30	19	11	47	23	70	15	14	A-6a	7						
	20	SS-3	4.5	6.0	3.0	4.5	22		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	10	10	2.25	34	21	13	43	36	79	18	16	A-6a	9						
3	B	SS-1	0.0	1.5	0.6	2.1	12			NP	NP	NP	21	6	27	8	8	A-3a	0	100					
	003-0	SS-2	1.5	3.0	2.1	3.6	11									10	8	A-3a	0						
	20	SS-3	3.0	4.5	3.6	5.1	7									9	8	A-3a	0						
		SS-4	4.5	6.0	5.1	6.6	7	7	1.5	25	18	7	50	25	75	23	13	A-4b							
4	B	SS-1	1.5	3.0	0.0	1.5	15									10	10	A-2-6	4	100					
	004-0	SS-2	3.0	4.5	1.5	3.0	26		4.25	24	15	9	25	13	38	11	10	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	23		4.5							15	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	10	10	2	29	17	12	31	21	52	16	12	A-4a	4						
5	B	SS-2	1.5	3.0	0.0	1.5	16			NP	NP	NP	13	3	16	8	6	A-1-b	0	100					
	005-0	SS-3	3.0	4.5	1.5	3.0	16									8	6	A-1-b	0						
	20	SS-4	4.5	6.0	3.0	4.5	8		1.5							25	10	A-4a	8						
								8																	
6	B	SS-1	0.0	1.5	-0.4	1.1	25		4.5	28	20	8	31	16	47	11	15	A-4a	2	100					
	006-0	SS-2	1.5	3.0	1.1	2.6	8									17	10	A-4a	8			N_{60} & Mc		12"	
	20	SS-3	3.0	4.5	2.6	4.1	7		4.25	29	17	12	40	27	67	16	14	A-6a	7						
		SS-4	4.5	6.0	4.1	5.6	14	7	4.25							16	14	A-6a	10						
7	B	SS-1	1.5	3.0	0.0	1.5	18		4.5	28	17	11	39	17	56	11	14	A-6a	5	150					
	007-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	27	17	10	33	19	52	12	12	A-4a	3						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.25							16	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	16	4.25							14	10	A-4a	8						
8	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	8	28	12	8	A-3a	0	100					
	008-0	SS-2	3.0	4.5	1.5	3.0	8		2.5							16	10	A-4a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	15		3	24	16	8	32	20	52	15	11	A-4a	3						
		SS-4	6.0	7.5	4.5	6.0	18	8	1.5							15	10	A-4a	8						
9	B	SS-1	1.5	3.0	0.0	1.5	15									11	10	A-2-4	0	250					
	009-0	SS-2	3.0	4.5	1.5	3.0	7		0.5	26	17	9	32	15	47	16	12	A-4a	2			HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		3.75	26	17	9	32	15	47	13	12	A-4a	2						
		SS-4	6.0	7.5	4.5	6.0	10	7	2.5							18	10	A-4a	8						

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Subgrade Analysis

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
10	B	SS-1	0.0	1.5	0.1	1.6	23		4.5	28	17	11	37	21	58	11	14	A-6a	5	170					
	010-0	SS-2	1.5	3.0	1.6	3.1	38		4.5	28	15	13	25	17	42	13	14	A-6a	2						
	20	SS-3	3.0	4.5	3.1	4.6	22		4.5							15	14	A-6a	10						
		SS-4	4.5	6.0	4.6	6.1	14	14	4.5							14	14	A-6a	10						
11	B	SS-1	1.5	3.0	0.0	1.5	16		1.75	25	16	9	38	26	64	15	11	A-4a	6	130		HP & Mc		**12"**	
	011-0	SS-2	3.0	4.5	1.5	3.0	12		2	25	16	9	27	12	39	14	11	A-4a	1			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	7		2.5							17	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	14	7	2.5							16	10	A-4a	8						
12	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	17	6	23	12	6	A-1-b	0	100					
	012-0	SS-2	3.0	4.5	1.5	3.0	11									11	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	11									13	6	A-1-b	0						
		SS-4	6.0	7.5	4.5	6.0	11	11		24	16	8	21	13	34	13	10	A-2-4	0						
13	B	SS-1	0.0	1.5	-0.5	1.0	15			NP	NP	NP	22	10	32	11	10	A-2-4	0	110					
	013-0	SS-2	1.5	3.0	1.0	2.5	31		4.5	29	19	10	50	36	86	18	14	A-4b	8		A-4b	Mc	**30"**		
	20	SS-3	3.0	4.5	2.5	4.0	30		4.5							18	10	A-4b	8						
		SS-4	4.5	6.0	4.0	5.5	18	15	4.5							14	10	A-4b	8						
14	B	SS-1	1.5	3.0	0.0	1.5	26			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	014-0	SS-2	3.0	4.5	1.5	3.0	27									12	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	14		2.25	20	13	7	24	13	37	11	10	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	19	14								16	10	A-2-4	0						
15	B	SS-1	0.0	1.5	-0.7	0.8	20									8	6	A-1-b	0	100					
	015-0	SS-2	1.5	3.0	0.8	2.3	34			NP	NP	NP	13	3	16	6	6	A-1-b	0						
	20	SS-3	3.0	4.5	2.3	3.8	20									10	6	A-1-b	0						
		SS-4	4.5	6.0	3.8	5.3	16	16								7	6	A-1-b	0						
16	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	20	10	30	10	10	A-2-4	0	100					
	016-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP				10	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	26									9	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	25	16								12	8	A-3a	0						
17	B	SS-1	0.0	1.5	-0.5	1.0	11			NP	NP	NP	14	12	26	12	8	A-3a	0	100					
	017-0	SS-2	1.5	3.0	1.0	2.5	14			35	19	16	13	12	25	15	10	A-2-6	1			N_{60} & Mc		**12"**	
	20	SS-3	3.0	4.5	2.5	4.0	10									15	10	A-2-6	4						
		SS-4	4.5	6.0	4.0	5.5	4	4								16	10	A-2-6	4						
18	B	SS-1	1.5	3.0	0.0	1.5	16									11	10	A-4a	8	100					
	018-0	SS-2	3.0	4.5	1.5	3.0	29			NP	NP	NP	25	11	36	8	11	A-4a	0						
	20	SS-3	4.5	6.0	3.0	4.5	23									7	6	A-1-b	0						
		SS-4A	6.0	7.2	4.5	5.7	11	11								7	6	A-1-b	0						

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Subgrade Analysis

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#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
19	B	SS-1A	1.5	2.0	0.0	0.5	20		4							12	10	A-4a	8	100					
	019-0	SS-1B	2.0	3.0	0.5	1.5	20			NP	NP	NP	14	3	17	9	8	A-3a	0						
	20	SS-2A	3.0	4.0	1.5	2.5	27			NP	NP	NP	13	4	17	8	6	A-1-b	0						
		SS-2B	4.0	4.5	2.5	3.0	27	20	1							14	10	A-4a	8			HP & Mc			
20	B	SS-1	1.5	3.0	0.0	1.5	29									10	10	A-2-4	0	140					
	020-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	24	7	31	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	19									6	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	10	10								6	8	A-3a	0						
21	B	SS-1	1.5	3.0	0.0	1.5	19									10	8	A-3a	0	100					
	021-0	SS-2	3.0	4.5	1.5	3.0	18		3.25	21	17	4	39	12	51	17	12	A-4a	3			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									13	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	14	14	3.25	24	17	7	42	20	62	23	12	A-4a	5						
22	B	SS-1	0.0	1.5	-0.5	1.0	10		3	27	17	10	30	17	47	12	12	A-4a	2	120		N_{60}		**12"**	
	022-0	SS-2	1.5	3.0	1.0	2.5	25		4.5							11	10	A-4a	8						
	20	SS-3	3.0	4.5	2.5	4.0	19		4.5							12	10	A-4a	8						
		SS-4	4.5	6.0	4.0	5.5	12	10	4.5	31	17	14	37	30	67	14	12	A-4a	8						
23	B	SS-1	1.5	3.0	0.0	1.5	20		4.5							20	14	A-6a	10	110		Mc			
	023-0	SS-2	3.0	4.5	1.5	3.0	15		4.5	31	20	11	37	19	56	14	15	A-6a	5						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	16	15	4.5	39	20	19	48	39	87	19	16	A-6b	12						
24	B	SS-1A	0.0	1.0	-0.4	0.6	82		4.5							10	6	A-1-b	0	2000					
	024-0	SS-2	1.0	3.0	0.6	2.6	35		4.5	30	18	12	41	31	72	15	14	A-6a	8						
	20	SS-3	3.0	4.5	2.6	4.1	18		4.5	35	19	16	41	36	77	17	16	A-6b	10						
		SS-4	4.5	6.0	4.1	5.6	19	18	4.5							18	16	A-6b	16						
25	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	28	18	10	52	32	84	20	13	A-4b	8		A-4b	N_{60} & Mc		**12"**	
	025-0	SS-2	3.0	4.5	1.5	3.0	12		2.75							19	10	A-4b	8	110	A-4b	N_{60} & Mc	**36"**		
	20	SS-3	4.5	6.0	3.0	4.5	29		3.5	24	16	8	24	13	37	13	11	A-4a	0						
		SS-4	6.0	7.5	4.5	6.0	12	12	3.25							22	10	A-4a	8						
26	B	SS-1	0.0	1.5	-1.0	0.5	11		4.5	23	16	7	33	21	54	11	11	A-4a	4	110		N_{60}		**12"**	
	026-0	SS-2	1.5	3.5	0.5	2.5	38		3.5	25	19	6	75	23	98	26	14	A-4b	8		A-4b	Mc	**30"**		
	20	SS-3B	3.5	4.5	2.5	3.5	20									10	8	A-3	0						
		SS-4	4.5	6.0	3.5	5.0	20	11								10	8	A-3	0						
27	B	SS-1	0.0	1.5	0.0	1.5	14			NP	NP	NP	28	13	41	10	11	A-4a	1	100					
	027-0	SS-2	1.5	3.0	1.5	3.0	16			NP	NP	NP	85	12	97	25	11	A-4b	8		A-4b	Mc			
	20	SS-3	3.0	4.5	3.0	4.5	14									15	8	A-3a	0						
		SS-4	4.5	6.0	4.5	6.0	10	10								22	10	A-4a	8						

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Subgrade Analysis

V. 14.5 1/18/2019

#	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	3.0	0.0	1.5	11		4.5	22	15	7	33	22	55	13	10	A-4a	4	100		N_{60} & Mc		**12"**	
	028-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	26	17	9	42	30	72	14	12	A-4a	7						
	20	SS-3	4.5	6.0	3.0	4.5	18		3							14	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	23	11	2.25							15	14	A-6a	10						
29	B	SS-1	1.5	3.0	0.0	1.5	20									8	10	A-2-4	0	100					
	029-0	SS-2	3.0	4.5	1.5	3.0	26			NP	NP	NP	22	7	29	6	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	25		4.5	19	13	6	23	9	32	12	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	26	20								6	8	A-3a	0						
30	B	SS-1	0.0	1.5	-0.2	1.3	15		4.5	28	18	10	36	22	58	12	13	A-4a	5	5500					
	030-0	SS-2	1.5	3.0	1.3	2.8	26		4.5	28	17	11	38	28	66	12	14	A-6a	7						
	20	SS-3	3.0	4.5	2.8	4.3	19		4.5							13	14	A-6a	10						
		SS-4	4.5	6.0	4.3	5.8	12	12	4.25							14	14	A-6a	10						
31	B	SS-1	1.5	3.0	0.0	1.5	18		4.25	26	16	10	13	11	24	14	10	A-2-4	0			Mc			
	031-0	SS-2	3.0	4.5	1.5	3.0	19		2	26	17	9	46	33	79	21	12	A-4a	8			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	12		4.5							24	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	12	3							26	10	A-4a	8						
32	B	SS-1	0.7	1.5	0.0	0.8	5		2.25	32	20	12	36	20	56	17	15	A-6a	5	100		N_{60}		**21"**	
	032-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	33	18	15	43	32	75	15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	22		4.5							15	10	A-4a	8						
		SS-4	4.5	6.0	3.8	5.3	11	5	4							20	10	A-4a	8						
33	B	SS-1	1.5	3.0	0.0	1.5	25		4.5	32	18	14	38	30	68	13	14	A-6a	8	1400					
	033-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	28	17	11	37	24	61	12	14	A-6a	6						
	20	SS-3	4.5	6.0	3.0	4.5	16		4.5							12	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	18	16	4.5							13	14	A-6a	10						
34	B	SS-1	1.5	3.0	0.0	1.5	15		4.5	25	15	10	28	15	43	12	10	A-4a	2	310					
	034-0	SS-2	3.0	4.5	1.5	3.0	12		4.25	25	15	10	29	18	47	13	10	A-4a	2			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		4.5							13	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	15	12	4.5							17	14	A-6a	10						
35	B	SS-1	0.0	1.5	-1.1	0.4	10		4.5	32	18	14	38	23	61	16	14	A-6a	7	190		N_{60}		**12"**	
	035-0	SS-2	1.5	3.0	0.4	1.9	25		4.5	31	19	12	30	20	50	12	14	A-6a	4						
	20	SS-3	3.0	4.5	1.9	3.4	27		1.5							24	14	A-6a	10			HP & Mc			
		SS-4	4.5	6.0	3.4	4.9	14	10	3							16	14	A-6a	10						
36	B	SS-1	0.0	1.5	-0.6	0.9	10		4.5	26	17	9	28	15	43	15	12	A-4a	2	100		N_{60} & Mc		**12"**	
	036-0	SS-2	1.5	3.0	0.9	2.4	22		4.5	34	18	16	40	27	67	15	16	A-6b	9						
	20	SS-3	3.0	4.5	2.4	3.9	23		4.5							18	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	18	10	4.5	34	19	15	37	20	57	12	14	A-6a	6						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
37	B	SS-1	1.5	3.0	0.0	1.5	14									18	14	A-6a	10	380		N_{60} & Mc		12"	
	037-0	SS-2	3.0	4.5	1.5	3.0	16		4.5	39	22	17	36	31	67	17	17	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	23		3.5	29	19	10	27	14	41	11	14	A-4a	1						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
38	B	SS-1	0.0	1.5	-0.8	0.8	10		4.5	31	19	12	36	20	56	13	14	A-6a	5	160		N_{60}		12"	
	038-0	SS-2	1.5	3.0	0.8	2.3	27		4.5							15	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	15		4.5							14	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	26	10	4.5	30	19	11	43	32	75	13	14	A-6a	8						
39	B	SS-1	0.0	1.5	-0.7	0.8	11		4.5	30	17	13	39	25	64	13	14	A-6a	7	230		N_{60}		12"	
	039-0	SS-2	1.5	3.0	0.8	2.3	38		4.5							11	14	A-6a	10						
	20	SS-3	3.0	4.5	2.3	3.8	18		4.5							12	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	18	11	4.5	22	15	7	31	14	45	12	10	A-4a	2						
40	B	SS-1	1.5	3.0	0.0	1.5	31		3	18	13	5	28	12	40	11	10	A-4a	1	100					
	040-0	SS-2	3.0	4.5	1.5	3.0	34			NP	NP	NP	28	13	41	10	11	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	41									9	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	33	30								9	10	A-4a	8						
41	B	SS-1	0.0	1.5	-0.6	0.9	30									7	10	A-2-4	0	100					
	041-0	SS-2	1.5	2.0	0.9	1.4	50									7	6	A-1-a	0						
	20	SS-3	3.0	4.5	2.4	3.9	52		4.25	41	25	16	33	12	45	13	22	A-7-6	4						
		SS-4	4.5	6.0	3.9	5.4	66	30	4.5							8	18	A-7-6	16						
42	B	SS-1	1.5	3.0	0.0	1.5	29			22	16	6	25	9	34	8	10	A-2-4	0	150					
	042-0	SS-2	3.0	4.3	1.5	2.8	50									8	0	Rock	0		Rock	Mc			
	20	SS-3	4.5	5.4	3.0	3.9	50									6	0	Rock	0						
		SS-4	6.0	6.5	4.5	5.0	50	29									0	Rock	0						
43	B	SS-1	1.5	3.0	0.0	1.5	16			NP	NP	NP	19	5	24	8	6	A-1-b	0	100					
	043-0	SS-2	3.0	4.5	1.5	3.0	27									16	10	A-2-4	0			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	25									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	18	16								11	8	A-3a	0						
44	B	SS-1	0.0	1.5	-0.6	0.9	7		4.5	29	21	8	38	21	59	14	16	A-4a	5	100		N_{60}		15"	
	044-0	SS-2	1.5	3.0	0.9	2.4	11		4.25	25	18	7	42	20	62	15	13	A-4a	5			N_{60}		12"	
	20	SS-3	3.0	4.5	2.4	3.9	3									23	10	A-4a	8						
		SS-4	4.5	6.0	3.9	5.4	22	3								12	10	A-2-6	4						
45	B	SS-1	0.0	1.5	-0.3	1.2	15		4.5	25	18	7	33	19	52	13	13	A-4a	3	170					
	045-0	SS-2	1.5	3.0	1.2	2.7	15		4.25	21	15	6	33	16	49	12	10	A-4a	3						
	20	SS-3	3.0	4.5	2.7	4.2	11		2.5							13	10	A-4a	8						
		SS-4	4.5	6.0	4.2	5.7	19	11	4.5							12	10	A-4a	8						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
46	B	SS-1	1.5	3.0	0.0	1.5	11		2.25	23	14	9	32	16	48	13	10	A-4a	3	110		N_{60} & Mc		**12"**	
	046-0	SS-2	3.0	4.5	1.5	3.0	20		4.5	27	17	10	43	24	67	14	12	A-4a	6						
	20	SS-3	4.5	6.0	3.0	4.5	18		4.5							13	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	26	11	4.5							15	10	A-4a	8						
47	B	SS-1	0.0	1.5	-0.7	0.8	16		4.5	25	16	9	34	22	56	11	11	A-4a	4						
	047-0	SS-2	1.5	3.0	0.8	2.3	45		4.5							13	10	A-4a	8	110		Mc			
	20	SS-3	3.0	4.5	2.3	3.8	20		4.5	34	19	15	37	42	79	18	14	A-6a	10						
		SS-4	4.5	6.0	3.8	5.3	16	16	3							17	14	A-6a	10						
48	B	SS-1	1.5	3.0	0.0	1.5	19									8	6	A-1-b	0	110					
	048-0	SS-2	3.0	4.5	1.5	3.0	18		4.5	34	17	17	39	29	68	15	16	A-6b	9						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5							16	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	20	18	4.5							21	16	A-6b	16						
49	B	SS-1	0.0	1.5	-0.7	0.8	14		3.75	39	20	19	34	24	58	17	16	A-6b	8	490					
	049-0	SS-2	1.5	3.0	0.8	2.3	25		4.5	41	20	21	44	33	77	19	18	A-7-6	13						
	20	SS-3	3.0	4.5	2.3	3.8	16		4.25							17	18	A-7-6	16						
		SS-4	4.5	6.0	3.8	5.3	12	12	3.75							19	18	A-7-6	16						
50	B	SS-1	1.5	3.0	0.0	1.5	31		4.5	27	18	9	25	14	39	11	13	A-4a	1	100					
	050-0	SS-2	3.0	4.5	1.5	3.0	29		4.5	36	20	16	33	20	53	11	16	A-6b	6						
	20	SS-3	4.5	6.0	3.0	4.5	31		4.5							9	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	63	29	4.5							10	16	A-6b	16						
51	B	SS-1	1.5	3.0	0.0	1.5	31		4.5							12	10	A-4a	8	100					
	051-0	SS-2	3.0	4.5	1.5	3.0	31		4.5	26	18	8	30	15	45	10	13	A-4a	2						
	20	SS-3	4.5	6.0	3.0	4.5	19		4.5	31	17	14	34	21	55	12	14	A-6a	6						
		SS-4	6.0	7.5	4.5	6.0	22	19	4.25							16	14	A-6a	10						
52	B	SS-1	1.5	3.0	0.0	1.5	16		3	25	17	8	23	10	33	10	10	A-2-4	0	100					
	052-0	SS-2	3.0	4.5	1.5	3.0	18			NP	NP	NP	10	4	14	6	6	A-1-a	0						
	20	SS-3	4.5	6.0	3.0	4.5	45									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	22	16								11	10	A-2-4	0						
53	B	SS-1	0.0	1.5	0.0	1.5	7		4	36	22	14	31	18	49	17	17	A-6a	4	100		N_{60}		**15"**	
	053-0	SS-2	1.5	3.0	1.5	3.0	15		4.5	34	21	13	47	28	75	19	16	A-6a	9			Mc			
	20	SS-3	3.0	4.5	3.0	4.5	20		4.5							23	14	A-6a	10						
		SS-4	4.5	6.0	4.5	6.0	23	7	4.5							16	14	A-6a	10						
54	B	SS-1	0.0	1.5	-0.8	0.7	8		2.5	35	20	15	28	17	45	15	15	A-6a	4	100		N_{60}		**12"**	
	054-0	SS-2	1.5	3.0	0.7	2.2	23		4.5	28	18	10	44	29	73	15	13	A-4a	8						
	20	SS-3	3.0	4.5	2.2	3.7	15		2.75							16	10	A-4a	8						
		SS-4	4.5	6.0	3.7	5.2	15	8	2.25							16	10	A-4a	8						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
55	B	SS-1	0.0	1.5	-1.4	0.1	10		1.5	39	22	17	31	24	55	20	17	A-6b	7	120		HP & Mc		**12"**	
	055-0	SS-2	1.5	3.0	0.1	1.6	15		4.5	37	20	17	40	47	87	18	16	A-6b	11						
	20	SS-3	3.0	4.5	1.6	3.1	22		3.25							18	16	A-6b	16						
		SS-4	4.5	6.0	3.1	4.6	15	10	1.75							14	16	A-6b	16						
56	B	SS-1	0.0	1.5	-0.6	0.9	14		2.5	30	17	13	39	25	64	14	14	A-6a	7	350					
	056-0	SS-2	1.5	3.0	0.9	2.4	19		3.75	37	20	17	37	23	60	17	16	A-6b	8						
	20	SS-3	3.0	4.5	2.4	3.9	23		2.75							16	16	A-6b	16						
		SS-4	4.5	6.0	3.9	5.4	14	14	3							14	16	A-6b	16						
57	B	SS-1	1.5	3.0	0.0	1.5	14			NP	NP	NP	36	14	50	10	11	A-4a	3	100					
	057-0	SS-2	3.0	4.5	1.5	3.0	15			NP	NP	NP	19	11	30	11	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	12									18	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	11	11	2.5							17	14	A-6a	10						
58	B	SS-1	1.5	3.0	0.0	1.5	11		4.5	29	18	11	22	14	36	12	13	A-4a	0	110		N_{60}		**12"**	
	058-0	SS-2	3.0	4.5	1.5	3.0	8		2.25	38	35	3	33	16	49	20	30	A-6b	3			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	5		2							15	16	A-6b	16						
		SS-4	6.0	7.5	4.5	6.0	7	5	3							20	16	A-6b	16						
59	B	SS-1	1.5	3.0	0.0	1.5	12		4.5	26	15	11	31	21	52	13	14	A-6a	4	110					
	059-0	SS-2	3.0	4.5	1.5	3.0	15		4.25	24	14	10	32	21	53	14	10	A-4a	4			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		2.25							18	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	15	10	2							20	10	A-4a	8						
60	B	SS-1	1.5	3.0	0.0	1.5	14		3.5	18	13	5	26	13	39	11	10	A-4a	1						
	060-0	SS-2	3.0	4.5	1.5	3.0	31		1.5	27	15	12	31	20	51	15	14	A-6a	4			HP			
	20	SS-3	4.5	6.0	3.0	4.5	20		4.5							10	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	22	14	4.5							13	10	A-4a	8						
61	B	SS-1	0.0	1.5	-0.5	1.0	8		2	38	27	11	28	17	45	15	22	A-6a	2	100		N_{60}		**12"**	
	061-0	SS-2	1.5	3.0	1.0	2.5	11		2	42	30	12	32	18	50	20	25	A-6a	4			N_{60}		**12"**	
	20	SS-3	3.0	4.5	2.5	4.0	11		2.5							19	14	A-6a	10						
		SS-4	4.5	6.0	4.0	5.5	19	8	4.5							13	10	A-4a	8						
62	B	SS-1	1.5	3.0	0.0	1.5	29									9	8	A-3a	0	100					
	062-0	SS-2	3.0	4.5	1.5	3.0	27		4.5	30	19	11	44	41	85	15	14	A-6a	8						
	20	SS-3	4.5	6.0	3.0	4.5	33		4.5	32	18	14	40	35	75	15	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	35	27	4.5							14	14	A-6a	10						
63	B	SS-1	0.0	1.5	-0.3	1.2	11		2.25	30	17	13	29	24	53	17	14	A-6a	5	140		N_{60} & Mc		**12"**	
	063-0	SS-2	1.5	3.0	1.2	2.7	8		2.25	43	21	22	38	47	85	23	18	A-7-6	13			N_{60} & Mc			
	20	SS-3	3.0	4.5	2.7	4.2	15		1.5							24	18	A-7-6	16						
		SS-4	4.5	6.0	4.2	5.7	18	8	1.75							28	18	A-7-6	16						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 63

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	7

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	2%	HP ≤ 0.5	0%
$N_{60} < 12$	20%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	12%	1 < HP ≤ 2	7%
$N_{60} \geq 20$	40%	HP > 2	62%
M+	12%		
Rock	1%		
Unsuitable	4%		

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

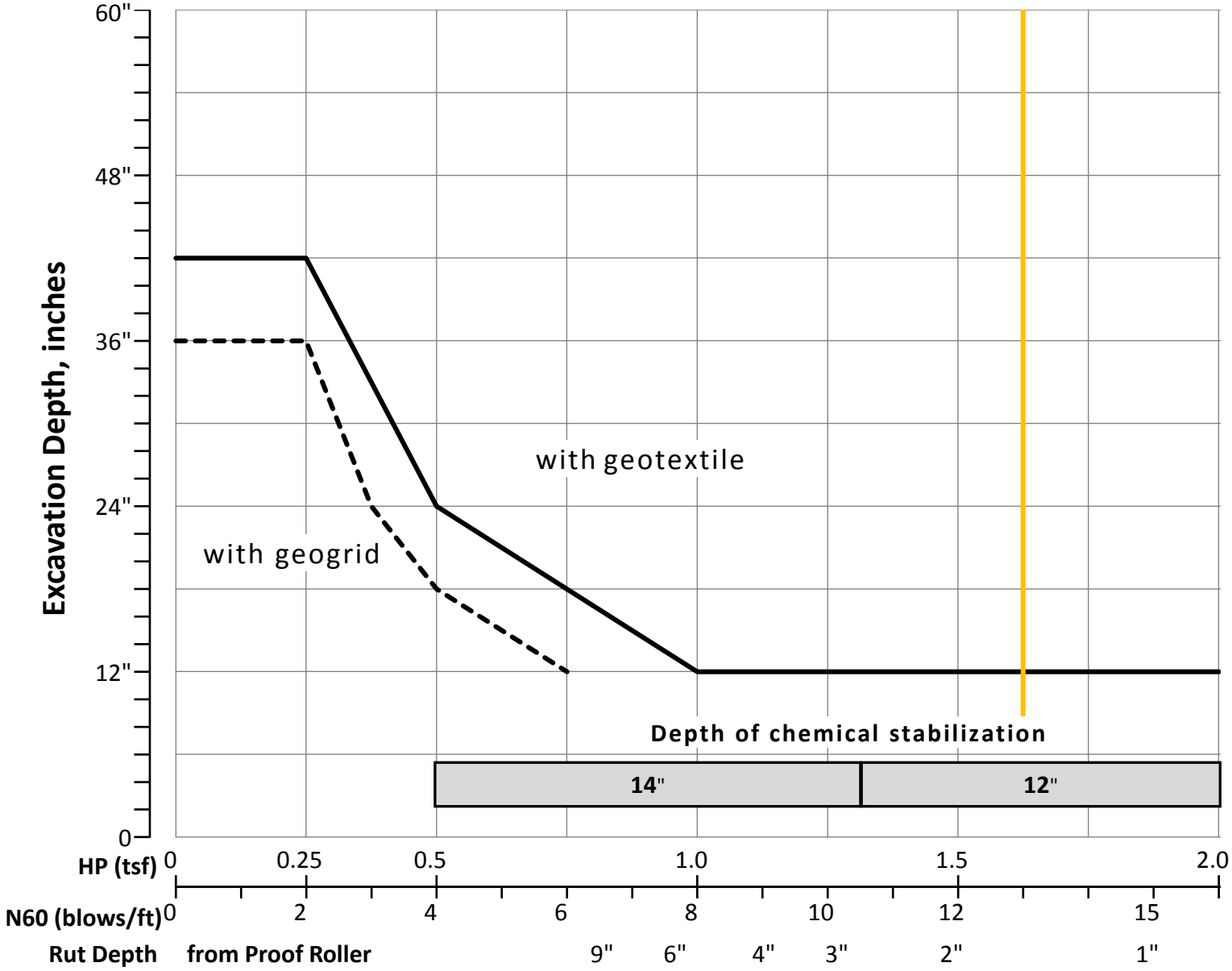
% Proposed Subgrade Surface	
Unstable & Unsuitable	34%
Unstable	30%
Unsuitable	4%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	20	13	3.74	29	18	11	33	20	52	14	12	6
Maximum	82	30	4.50	43	35	22	85	47	98	28	30	16
Minimum	3	3	0.50	18	13	3	10	3	14	6	0	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	3	2	16	20	0	5	0	2	20	81	8	0	63	23	0	8	0	0	251
Percent	1%	1%	6%	8%	0%	2%	0%	1%	8%	32%	3%	0%	25%	9%	0%	3%	0%	0%	100%
% Rock|Granular|Cohesive	1%	58%									41%								100%
Surface Class Count	1	2	12	14	0	3	0	1	10	47	6	0	37	13	0	5	0	0	151
Surface Class Percent	1%	1%	8%	9%	0%	2%	0%	1%	7%	31%	4%	0%	25%	9%	0%	3%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.74		☐ HP
13.10		☐ N60L

Average HP
Average N_{60L}

RAMP A & B

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp A & B (Northbound Rest Area)
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
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NO. OF BORINGS: 3

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-089-0-20	Ramp A	88+52	17	LT	CME 45B	82	1162.0	1160.5	1.5 C
2	B-090-0-20	Ramp B	7+13	9	LT	CME 45B	82	1159.2	1157.7	1.5 C
3	B-091-0-20	IR-77	803+00	92	RT	CME 45B	82	1159.8	1158.3	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	0.0	1.5	22																		
	089-0	SS-2	3.0	4.5	1.5	3.0	26		4.5	32	17	15	29	27	56	11	14	A-6a	6	110					
	20	SS-3	4.5	6.0	3.0	4.5	29		4.5	33	20	13	36	34	70	14	15	A-6a	8						
		SS-4	6.0	7.5	4.5	6.0	33	22	4.5							12	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	18		4.5	21	16	5	30	14	44	11	11	A-4a	2						
	090-0	SS-2	3.0	4.5	1.5	3.0	10		4.5							13	10	A-4a	8	170		N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	14		2.25	32	18	14	35	32	67	19	14	A-6a	8						
		SS-4	6.0	7.5	4.5	6.0	16	10	1							31	14	A-6a	10						
3	B	SS-1	1.5	3.0	0.0	1.5	12			NP	NP	NP	18	9	27	12	10	A-2-4	0	170					
	091-0	SS-2	3.0	4.5	1.5	3.0	14									17	10	A-2-4	0			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	12		3.25	32	18	14	31	23	54	15	14	A-6a	5						
		SS-4	6.0	7.5	4.5	6.0	10	10	2							23	14	A-6a	10						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 3

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	7

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	0%
$N_{60} < 12$	17%	0.5 < HP ≤ 1	8%
$12 \leq N_{60} < 15$	33%	1 < HP ≤ 2	8%
$N_{60} \geq 20$	33%	HP > 2	58%
M+	17%		
Rock	0%		
Unsuitable	0%		

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

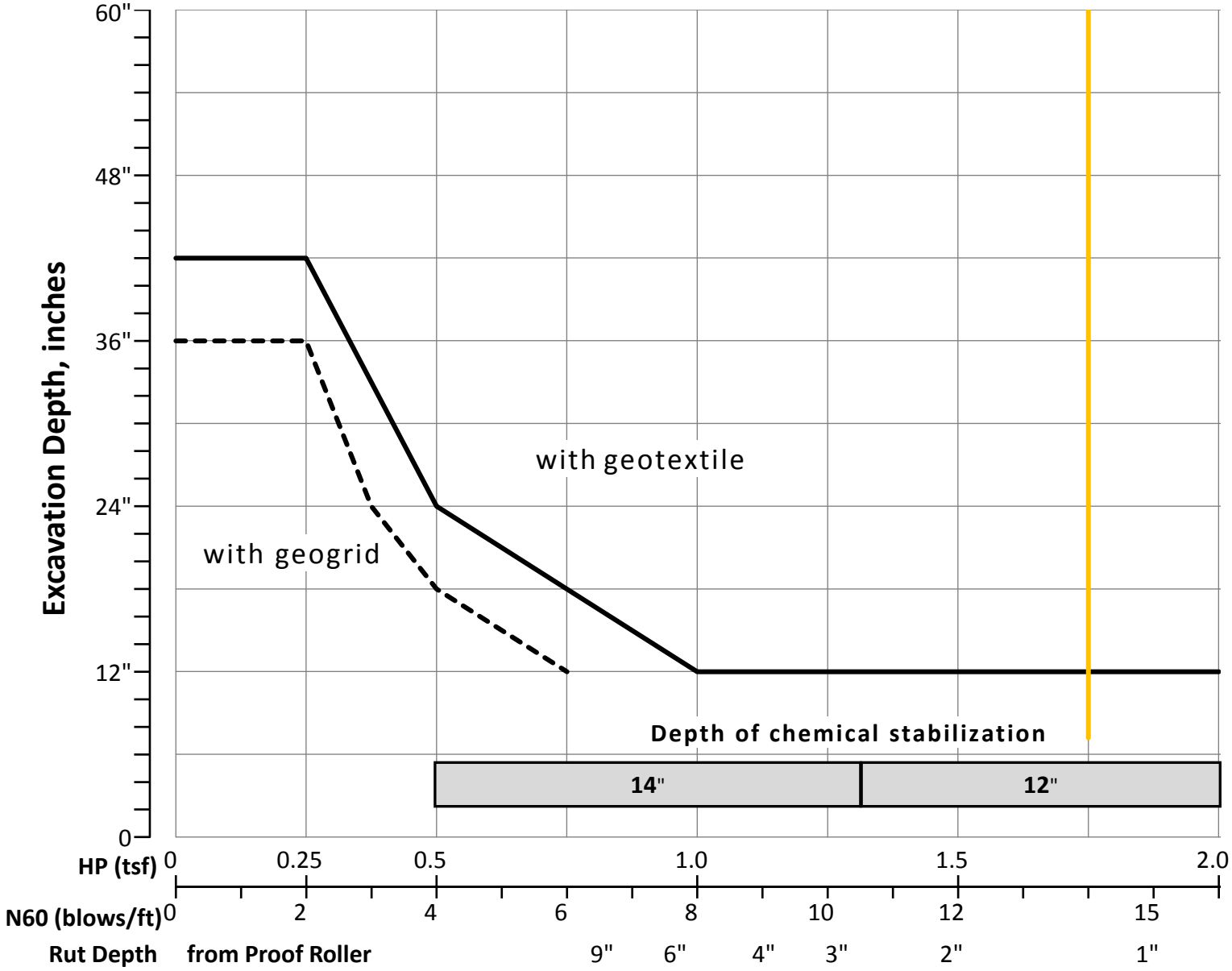
% Proposed Subgrade Surface	
Unstable & Unsuitable	40%
Unstable	40%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	18	14	3.44	30	18	12	30	23	53	16	13	6
Maximum	33	22	4.50	33	20	15	36	34	70	31	15	10
Minimum	10	10	1.00	21	16	5	18	9	27	11	10	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	2	0	0	0	0	0	2	0	0	7	0	0	0	0	0	11
Percent	0%	0%	0%	18%	0%	0%	0%	0%	0%	18%	0%	0%	64%	0%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	36%									64%								100%
Surface Class Count	0	0	0	2	0	0	0	0	0	2	0	0	1	0	0	0	0	0	5
Surface Class Percent	0%	0%	0%	40%	0%	0%	0%	0%	0%	40%	0%	0%	20%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.44		☐ HP
14.00		☐ N60L

Average HP
Average N_{60L}

RAMP C & D

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp C & D (Southbound Rest Area)
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

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NO. OF BORINGS: 5

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-084-0-20	IR-77	786+82	97	LT	CME 55X	82	1170.5	1169.0	1.5 C
2	B-085-0-20	Ramp D	23+06	14	RT	CME 55X	82	1160.1	1158.6	1.5 C
3	B-086-0-20	Ramp C	99+01	13	RT	CME 55X	82	1154.7	1153.2	1.5 C
4	B-087-0-20	Ramp C	103+04	16	RT	CME 55X	82	1158.4	1156.9	1.5 C
5	B-088-0-20	Ramp C	107+16	1	LT	CME 45B	82	1161.3	1159.8	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	0.0	1.5	19		3	32	18	14	36	33	69	17	14	A-6a	8	100		Mc			
	084-0	SS-2	3.0	4.5	1.5	3.0	10		3.75							16	14	A-6a	10			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	20		3.5	30	19	11	39	19	58	17	14	A-6a	5						
		SS-4	6.0	7.5	4.5	6.0	16	10	3							20	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	18		3							12	14	A-6a	10	100					
	085-0	SS-2	3.0	4.5	1.5	3.0	10		4.5	28	16	12	36	26	62	14	14	A-6a	6			N_{60}			
	20	SS-3	4.5	6.0	3.0	4.5	11		0.75	69	34	35	42	48	90	17		A-7-5	20						
		SS-4	6.0	7.5	4.5	6.0	10	10	2.5							23		A-7-5	16						
3	B	SS-1	1.5	3.0	0.0	1.5	23		3.75	23	14	9	24	12	36	11	10	A-4a	0						
	086-0	SS-2	3.0	4.5	1.5	3.0	8		1.5							13	10	A-4a	8	100		HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	5		1	46	23	23	35	23	58	30	20	A-7-6	10						
		SS-4	6.0	7.5	4.5	6.0	7	5	0.75							33	18	A-7-6	16						
4	B	SS-1	1.5	3.0	0.0	1.5	11			NP	NP	NP	13	3	16	18	6	A-1-b	0	1200					
	087-0	SS-2	3.0	4.5	1.5	3.0	20		4.5	27	16	11	30	27	57	12	14	A-6a	5						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	20	11	4.5							13	14	A-6a	10						
5	B	SS-1	1.5	3.0	0.0	1.5	15			NP	NP	NP	21	9	30	9	8	A-3a	0	100					
	088-0	SS-2	3.0	4.5	1.5	3.0	16			NP	NP	NP	14	6	20	7	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	8			20	13	7	24	11	35	13	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	10	8								18	10	A-2-4	0						

PID: 111404

County-Route-Section: SUM-77-24.12

No. of Borings: 5

Geotechnical Consultant: NEAS Inc.

Prepared By: KCA

Date prepared: 1/11/2021

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):	0''
Global Geogrid Average(N60L):	0''
Average(HP):	0''

Design CBR	7

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	5%	HP ≤ 0.5	0%
$N_{60} < 12$	50%	0.5 < HP ≤ 1	15%
$12 \leq N_{60} < 15$	0%	1 < HP ≤ 2	5%
$N_{60} \geq 20$	25%	HP > 2	55%
M+	10%		
Rock	0%		
Unsuitable	10%		

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

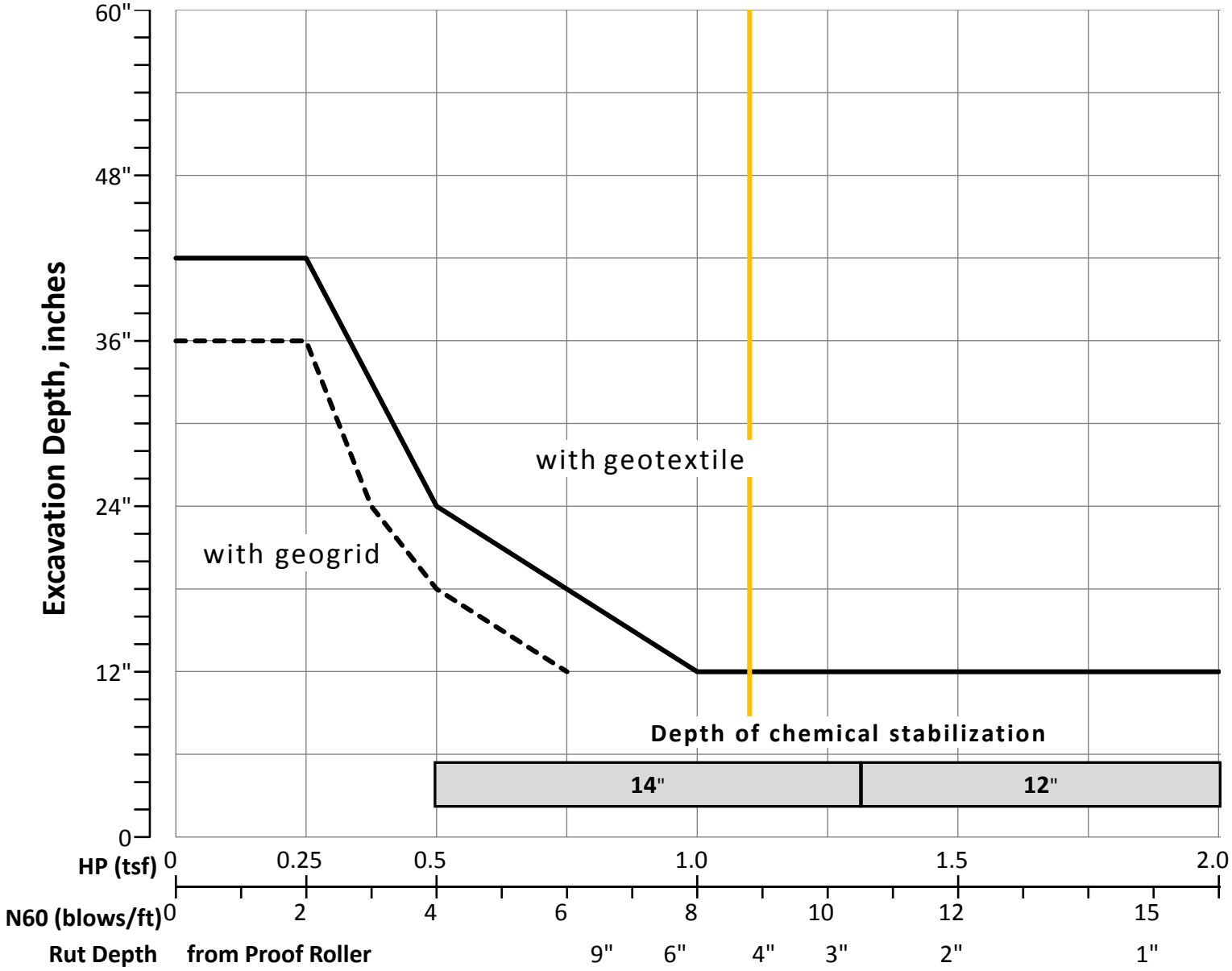
% Proposed Subgrade Surface	
Unstable & Unsuitable	40%
Unstable	40%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	14	9	2.95	34	19	15	29	20	48	16	13	7
Maximum	23	11	4.50	69	34	35	42	48	90	33	20	20
Minimum	5	5	0.75	20	13	7	13	3	16	7	6	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	1	2	0	0	0	0	2	2	0	0	9	0	2	2	0	0	20
Percent	0%	0%	5%	10%	0%	0%	0%	0%	10%	10%	0%	0%	45%	0%	10%	10%	0%	0%	100%
% Rock|Granular|Cohesive	0%	35%									65%								100%
Surface Class Count	0	0	1	0	0	0	0	0	2	2	0	0	5	0	0	0	0	0	10
Surface Class Percent	0%	0%	10%	0%	0%	0%	0%	0%	20%	20%	0%	0%	50%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
2.95		☐ HP
8.80		☐ N60L

Average HP
Average N_{60L}

RAMP L

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp L
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

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NO. OF BORINGS: 6

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-073-0-20	Ramp L	116+93	1	RT	CME 45B	82	1000.2	998.7	1.5 C
2	B-074-0-20	Ramp L	118+92	0	LT	CME 45B	82	998.0	996.5	1.5 C
3	B-075-0-20	Ramp L	120+95	15	RT	CME 45B	82	996.4	994.9	1.5 C
4	B-076-0-20	Ramp L	122+95	25	RT	CME 45B	82	998.8	997.8	1.0 C
5	B-077-0-20	Ramp L	124+91	12	RT	CME 45B	82	1003.3	1002.3	1.0 C
6	B-078-0-20	Ramp L	126+90	5	RT	CME 45B	82	1007.6	1006.6	1.0 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	2.5	4.0	1.0	2.5	14		4.5	26	16	10	28	20	48	14	11	A-4a	3			N_{60} & Mc		**12"**	
	073-0	SS-2	5.0	6.5	3.5	5.0	11		2.5							22	10	A-4a	8						
	20																								
								11																	
2	B	SS-1	1.5	3.0	0.0	1.5	10									8	8	A-3a	0	130					
	074-0	SS-2	3.0	4.5	1.5	3.0	12		3	22	15	7	25	15	40	12	10	A-4a	1						
	20	SS-3	4.5	6.0	3.0	4.5	8		2.75	40	24	16	41	21	62	30	19	A-6b	8						
		SS-4	6.0	7.5	4.5	6.0	10	8	1							23	10	A-4a	8						
3	B	SS-1	1.5	3.0	0.0	1.5	16			26	17	9	32	14	46	25	12	A-4a	2	310		Mc			
	075-0	SS-2	5.0	6.5	3.5	5.0	15		2.75							17	10	A-2-6	4						
	20																								
								15																	
4	B	SS-1	1.5	3.0	0.5	2.0	15		4.5	20	16	4	28	10	38	10	11	A-4a	1	100					
	076-0	SS-2	3.0	4.5	2.0	3.5	12			NP	NP	NP	41	7	48	13	11	A-4a	3						
	20	SS-3	4.5	6.0	3.5	5.0	11									13	10	A-4a	8						
		SS-4	6.0	7.5	5.0	6.5	11	11								9	10	A-4a	8						
5	B	SS-1	2.5	4.0	1.5	3.0	15			25	18	7	20	9	29	11	10	A-2-4	0						
	077-0	SS-2A	5.0	5.8	4.0	4.8	18									14	10	A-2-4	0						
	20	SS-2B	5.8	6.5	4.8	5.5	18		3							20	14	A-6a	10						
								15																	
6	B	SS-1	1.5	3.0	0.5	2.0	18		4.5	35	20	15	45	37	82	19	15	A-6a	10	100		Mc			
	078-0	SS-2	3.0	4.5	2.0	3.5	18		4.5	32	20	12	45	31	76	17	15	A-6a	9						
	20	SS-3	4.5	6.0	3.5	5.0	25		4.5							19	14	A-6a	10						
		SS-4	6.0	7.5	5.0	6.5	26	18	4.5							20	16	A-6b	16						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 6

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	7

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	0%
$N_{60} < 12$	32%	0.5 < HP ≤ 1	5%
$12 \leq N_{60} < 15$	16%	1 < HP ≤ 2	0%
$N_{60} \geq 20$	11%	HP > 2	58%
M+	16%		
Rock	0%		
Unsuitable	0%		

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

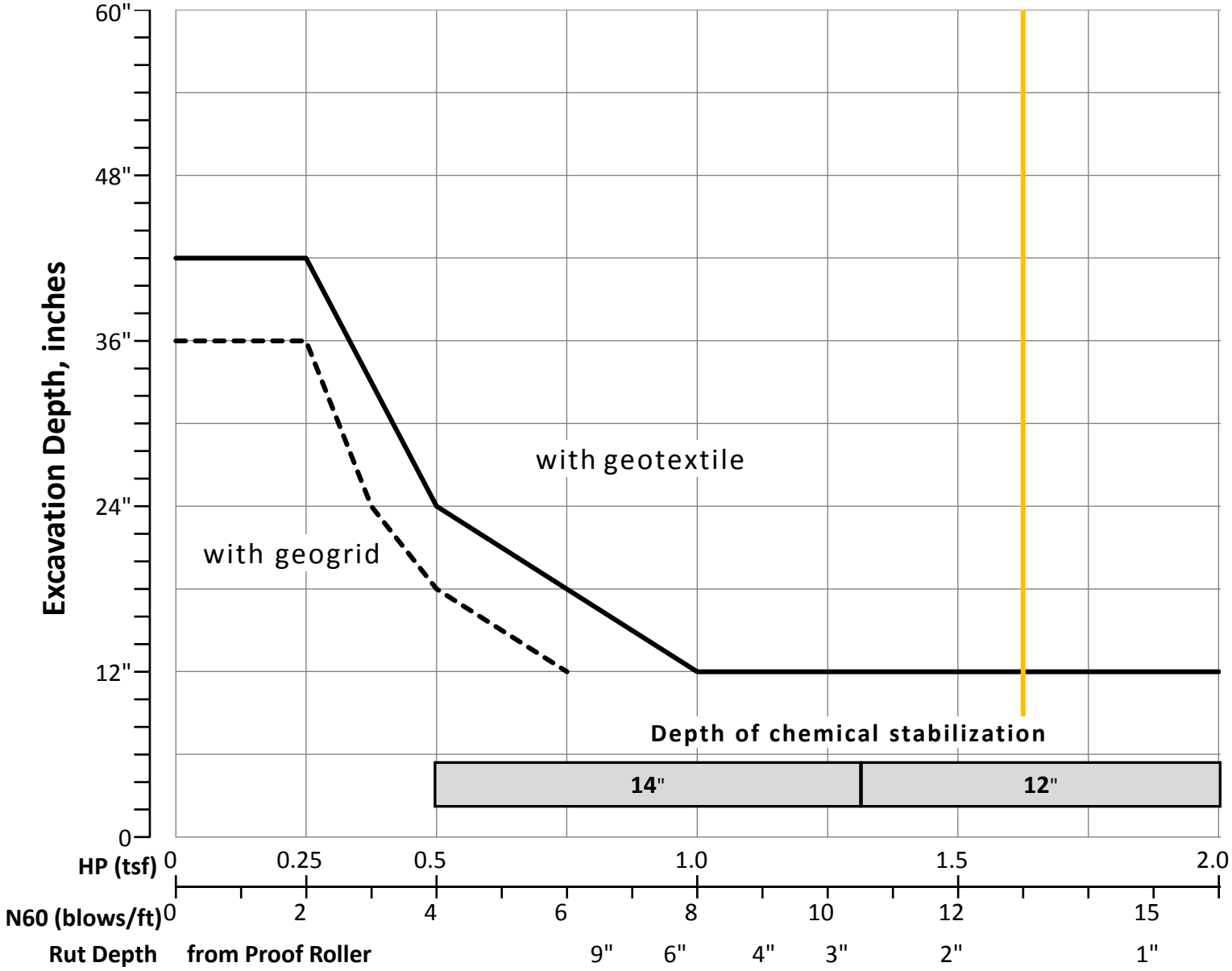
% Proposed Subgrade Surface	
Unstable & Unsuitable	33%
Unstable	33%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	15	13	3.50	28	18	10	34	18	52	17	12	6
Maximum	26	18	4.50	40	24	16	45	37	82	30	19	16
Minimum	8	8	1.00	20	15	4	20	7	29	8	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	2	0	1	0	0	1	9	0	0	4	2	0	0	0	0	19
Percent	0%	0%	0%	11%	0%	5%	0%	0%	5%	47%	0%	0%	21%	11%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	68%									32%								100%
Surface Class Count	0	0	0	1	0	0	0	0	1	5	0	0	2	0	0	0	0	0	9
Surface Class Percent	0%	0%	0%	11%	0%	0%	0%	0%	11%	56%	0%	0%	22%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.50		☐ HP
13.00		☐ N60L

Average HP
Average N_{60L}

RAMP M & N

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp M & N
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
2800 Corporated Exchange Drive
Suite 240
Columbus, OH 43231
(920) 427-0671
brendan.andrews@neasinc.com

NO. OF BORINGS: 5

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-079-0-20	Ghent Road	85+42	13	RT	CME 45B	82	999.3	997.8	1.5 C
2	B-080-0-20	Ramp M	127+44	73	RT	CME 45B	82	1002.8	1001.3	1.5 C
3	B-081-0-20	Ramp N	27+99	26	LT	CME 45B	82	1010.5	1009.0	1.5 C
4	B-082-0-20	Ramp N	31+00	35	RT	CME 45B	82	992.2	990.7	1.5 C
5	B-083-0-20	IR-77 NB	336+08	58	RT	CME 45B	82	975.5	974.0	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	25	16	9	38	22	60	12	11	A-4a	5	310					
	079-0	SS-2	3.0	4.5	1.5	3.0	12		4	29	18	11	43	31	74	19	14	A-6a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		3							23	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	15	10	2.5							21	14	A-6a	10						
2	B	SS-1	1.5	3.0	0.0	1.5	14									3	8	A-3a	0	100					
	080-0	SS-2	3.0	4.5	1.5	3.0	20			NP	NP	NP	16	6	22	6	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	19			NP	NP	NP	28	10	38	11	11	A-4a	1						
		SS-4	6.0	7.5	4.5	6.0	18	14								11	10	A-4a	8						
3	B	SS-1	1.5	3.0	0.0	1.5	16									10	8	A-3a	0	100					
	081-0	SS-2	3.0	4.5	1.5	3.0	16			NP	NP	NP	23	10	33	8	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	18		4.5	35	20	15	49	38	87	19	15	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	19	16	4.5							21	14	A-6a	10						
4	B	SS-1	1.5	3.0	0.0	1.5	19			NP	NP	NP	10	3	13	5	6	A-1-b	0	130					
	082-0	SS-2	3.0	4.5	1.5	3.0	15			NP	NP	NP	7	2	9	6	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	20									6	6	A-1-b	0						
		SS-4	6.0	7.5	4.5	6.0	19	15								8	6	A-1-b	0						
5	B	SS-1	1.5	3.0	0.0	1.5	26																		
	083-0	SS-2	3.0	4.5	1.5	3.0	18			NP	NP	NP	28	8	36	11	11	A-4a	0						
	20	SS-3	4.5	6.0	3.0	4.5	20		4.5	23	16	7	24	11	35	10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	25	18	4.25							14	10	A-2-4	0						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 5

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	9

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	0%
$N_{60} < 12$	5%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	15%	1 < HP ≤ 2	0%
$N_{60} \geq 20$	25%	HP > 2	40%
M+	5%		
Rock	0%		
Unsuitable	0%		

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

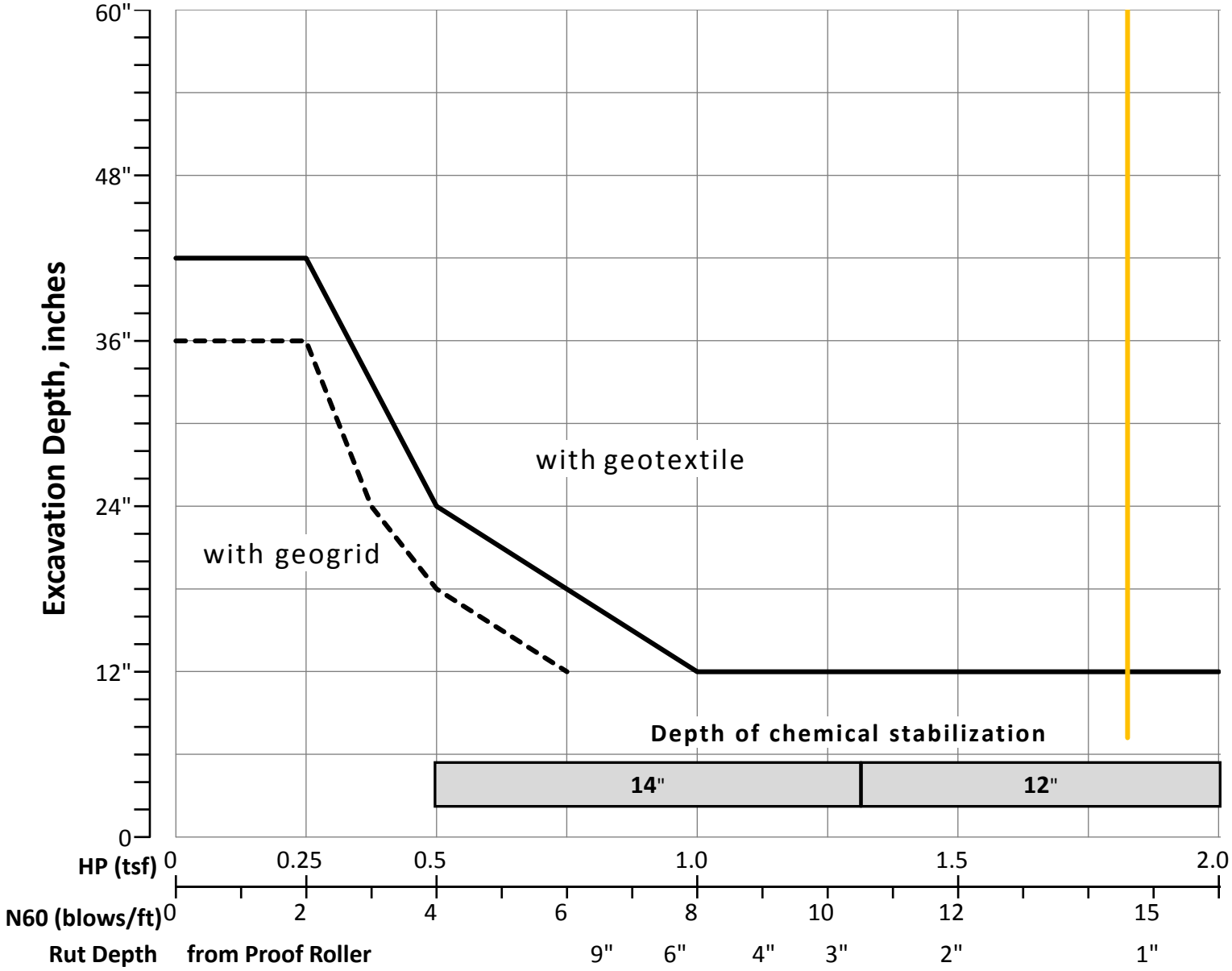
% Proposed Subgrade Surface	
Unstable & Unsuitable	11%
Unstable	11%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	18	15	3.97	28	18	11	27	14	41	12	10	3
Maximum	26	18	4.50	35	20	15	49	38	87	23	15	10
Minimum	10	10	2.50	23	16	7	7	2	9	3	6	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	5	3	0	0	0	0	2	4	0	0	5	0	0	0	0	0	19
Percent	0%	0%	26%	16%	0%	0%	0%	0%	11%	21%	0%	0%	26%	0%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	74%									26%								100%
Surface Class Count	0	0	3	1	0	0	0	0	2	2	0	0	1	0	0	0	0	0	9
Surface Class Percent	0%	0%	33%	11%	0%	0%	0%	0%	22%	22%	0%	0%	11%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.97		☐ HP
14.60		☐ N60L

Average HP
Average N_{60L}

RAMP P & R

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp P & R
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

Brendan P. Andrews
2800 Corporated Exchange Drive
Suite 240
Columbus, OH 43231
(920) 427-0671
brendan.andrews@neasinc.com

NO. OF BORINGS: 5

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-068-0-20	Ramp P	225+67	7	LT	CME 55X	82	997.0	995.5	1.5 C
2	B-069-0-20	Ramp P	221+81	15	RT	CME 55X	82	1007.8	1006.3	1.5 C
3	B-070-0-20	Ramp P	218+57	15	RT	CME 55X	82	1009.4	1007.9	1.5 C
4	B-071-0-20	Ramp P	214+18	17	RT	CME 55X	82	1003.7	1002.2	1.5 C
5	B-072-0-20	Ramp R	17+63	9	LT	CME 55X	82	1006.1	1004.6	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	0.0	1.5	34									9	8	A-3a	0	830					
	068-0	SS-2	3.0	4.5	1.5	3.0	27			NP	NP	NP	22	4	26	7	8	A-3a	0						
	20	SS-3	4.5	6.0	3.0	4.5	23									7	8	A-3a	0						
		SS-4	6.0	7.5	4.5	6.0	22	22								8	8	A-3a	0						
2	B	SS-1	1.5	3.0	0.0	1.5	16									11	10	A-2-4	0	100					
	069-0	SS-2	3.0	4.5	1.5	3.0	25			21	16	5	22	7	29	11	10	A-2-4	0						
	20	SS-3	4.5	6.0	3.0	4.5	12									10	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	12	12								14	10	A-2-4	0						
3	B	SS-1	1.5	3.0	0.0	1.5	22		4.5	25	17	8	31	14	45	13	12	A-4a	2	100					
	070-0	SS-2	3.0	4.5	1.5	3.0	14		2.5	30	19	11	50	22	72	18	14	A-6a	8			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10		2.5							17	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	7	7								17	10	A-2-4	0						
4	B	SS-1	1.5	3.0	0.0	1.5	8		2.5							17	10	A-4a	8	100		N_{60} & Mc		**12"**	
	071-0	SS-2	3.0	4.5	1.5	3.0	7		0.25	26	18	8	34	16	50	18	13	A-4a	3			HP & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	10									14	10	A-2-6	4						
		SS-4	6.0	7.5	4.5	6.0	7	7								15	10	A-2-6	4						
5	B	SS-1	1.5	3.0	0.0	1.5	61			NP	NP	NP	15	4	19	11	6	A-1-b	0	280					
	072-0	SS-2	3.0	4.5	1.5	3.0	15									18	6	A-1-b	0						
	20	SS-3	4.5	6.0	3.0	4.5	26		4.5	23	14	9	29	17	46	12	10	A-4a	2						
		SS-4	6.0	7.5	4.5	6.0	19	15	4.5							10	10	A-4a	8						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 5

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	Option
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	10

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	0%	HP ≤ 0.5	5%
$N_{60} < 12$	30%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	15%	1 < HP ≤ 2	0%
$N_{60} \geq 20$	40%	HP > 2	30%
M+	15%		
Rock	0%		
Unsuitable	0%		

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

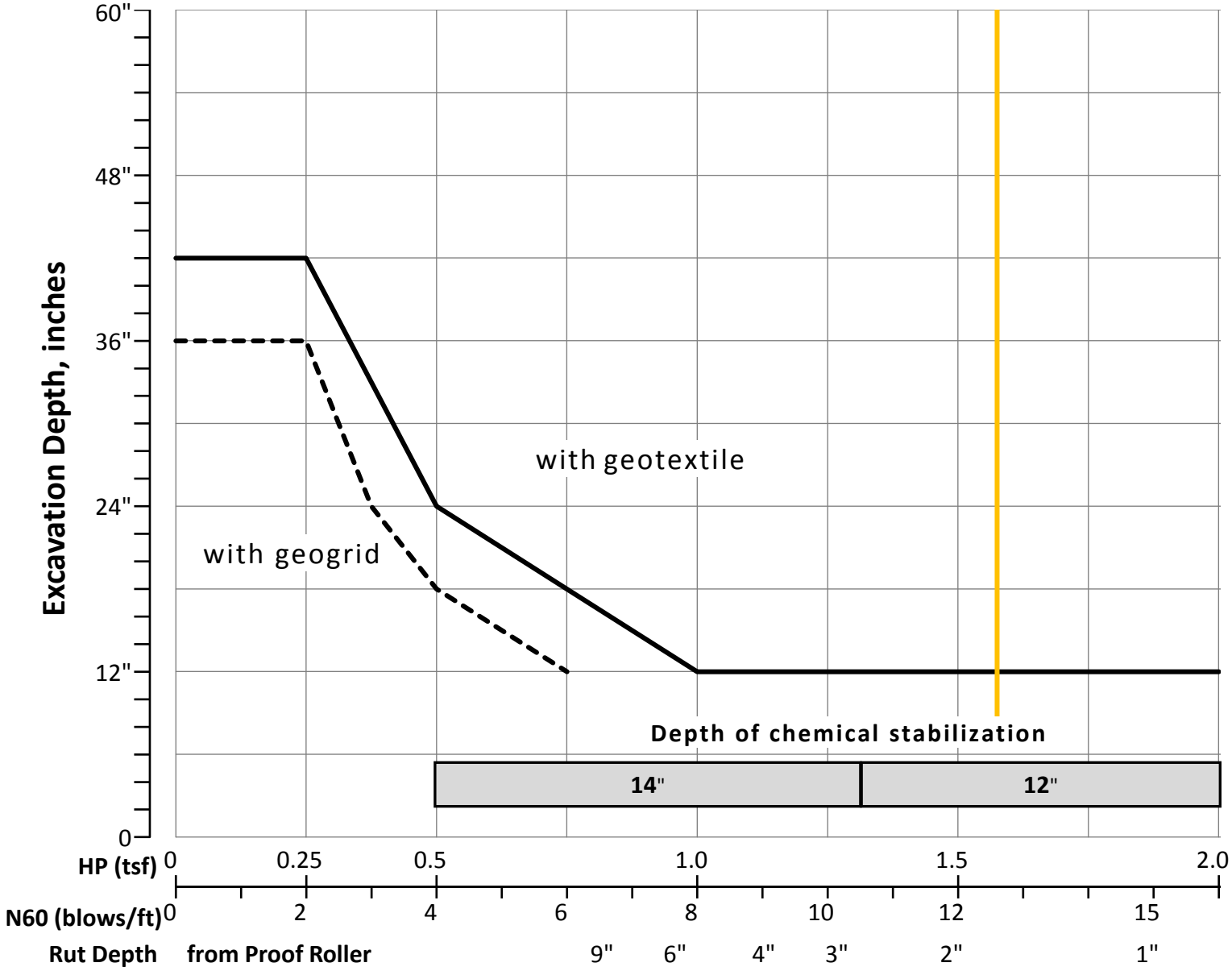
% Proposed Subgrade Surface	
Unstable & Unsuitable	30%
Unstable	30%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	19	13	3.04	25	17	8	29	12	41	13	10	2
Maximum	61	22	4.50	30	19	11	50	22	72	18	14	10
Minimum	7	7	0.25	21	14	5	15	4	19	7	6	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	2	5	0	2	0	0	4	5	0	0	2	0	0	0	0	0	20
Percent	0%	0%	10%	25%	0%	10%	0%	0%	20%	25%	0%	0%	10%	0%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	90%									10%								100%
Surface Class Count	0	0	2	2	0	0	0	0	2	3	0	0	1	0	0	0	0	0	10
Surface Class Percent	0%	0%	20%	20%	0%	0%	0%	0%	20%	30%	0%	0%	10%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.04		☐ HP
12.60		☐ N60L

Average HP
Average N_{60L}

RAMP S

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Bulletin GB1

SUM-77-24.12
111404
Ramp S
Widening of IR-77 NB & SB and associated ramps from SLM 24.02 to SLM 28.75

NEAS Inc.

Prepared By: KCA
Date prepared: Monday, January 11, 2021

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(920) 427-0671
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NO. OF BORINGS: 4

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-064-0-20	IR-77 SB	409+38	50	LT	CME 55X	82	1015.5	1014.0	1.5 C
2	B-065-0-20	Ramp S	14+70	17	LT	CME 55X	82	1016.2	1014.7	1.5 C
3	B-066-0-20	Ramp S	18+82	9	LT	CME 55X	82	1013.4	1011.9	1.5 C
4	B-067-0-20	Ramp S	22+92	4	LT	CME 55X	82	1009.5	1008.0	1.5 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.5 1/18/2019

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	SS-1	1.5	3.0	0.0	1.5	15		4.5	26	16	10	37	22	59	15	11	A-4a	5	100		Mc			
	064-0	SS-2	3.0	4.5	1.5	3.0	23		4.5	24	16	8	34	19	53	14	11	A-4a	4			Mc			
	20	SS-3	4.5	6.0	3.0	4.5	23									17	10	A-2-4	0						
		SS-4	6.0	7.5	4.5	6.0	40	15								13	10	A-2-4	0						
2	B	SS-1	1.5	3.0	0.0	1.5	14		4.5	27	19	8	44	22	66	16	14	A-4a	6	100					
	065-0	SS-2	3.0	4.5	1.5	3.0	15		4.5	22	16	6	33	13	46	12	11	A-4a	2						
	20	SS-3	4.5	6.0	3.0	4.5	16		4.5							16	10	A-4a	8						
		SS-4	6.0	7.5	4.5	6.0	34	14								11	6	A-1-a	0						
3	B	SS-1	1.5	3.0	0.0	1.5	20		4.25	25	15	10	31	14	45	15	10	A-4a	2	100		Mc			
	066-0	SS-2	3.0	4.5	1.5	3.0	12		2.5	29	18	11	41	19	60	19	14	A-6a	5			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	16		4.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	12	12								15	8	A-3a	0						
4	B	SS-1	1.5	3.0	0.0	1.5	14		3.25	24	14	10	20	10	30	14	10	A-2-4	0	100		N_{60} & Mc		**12"**	
	067-0	SS-2	3.0	4.5	1.5	3.0	5		3.5	24	16	8	21	12	33	13	10	A-2-4	0			N_{60} & Mc			
	20	SS-3	4.5	6.0	3.0	4.5	11		2.25							16	14	A-6a	10						
		SS-4	6.0	7.5	4.5	6.0	16	5	1.75							19	16	A-6b	16						

PID: 111404

County-Route-Section: SUM-77-24.12
No. of Borings: 4

Geotechnical Consultant: NEAS Inc.
Prepared By: KCA
Date prepared: 1/11/2021

Chemical Stabilization Options		
320	Rubblize & Roll	No
206	Cement Stabilization	Option
	Lime Stabilization	No
206	Depth	12''

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

Design CBR	8

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	6%	HP ≤ 0.5	0%
$N_{60} < 12$	13%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	25%	1 < HP ≤ 2	6%
$N_{60} \geq 20$	31%	HP > 2	69%
M+	38%		
Rock	0%		
Unsuitable	0%		

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

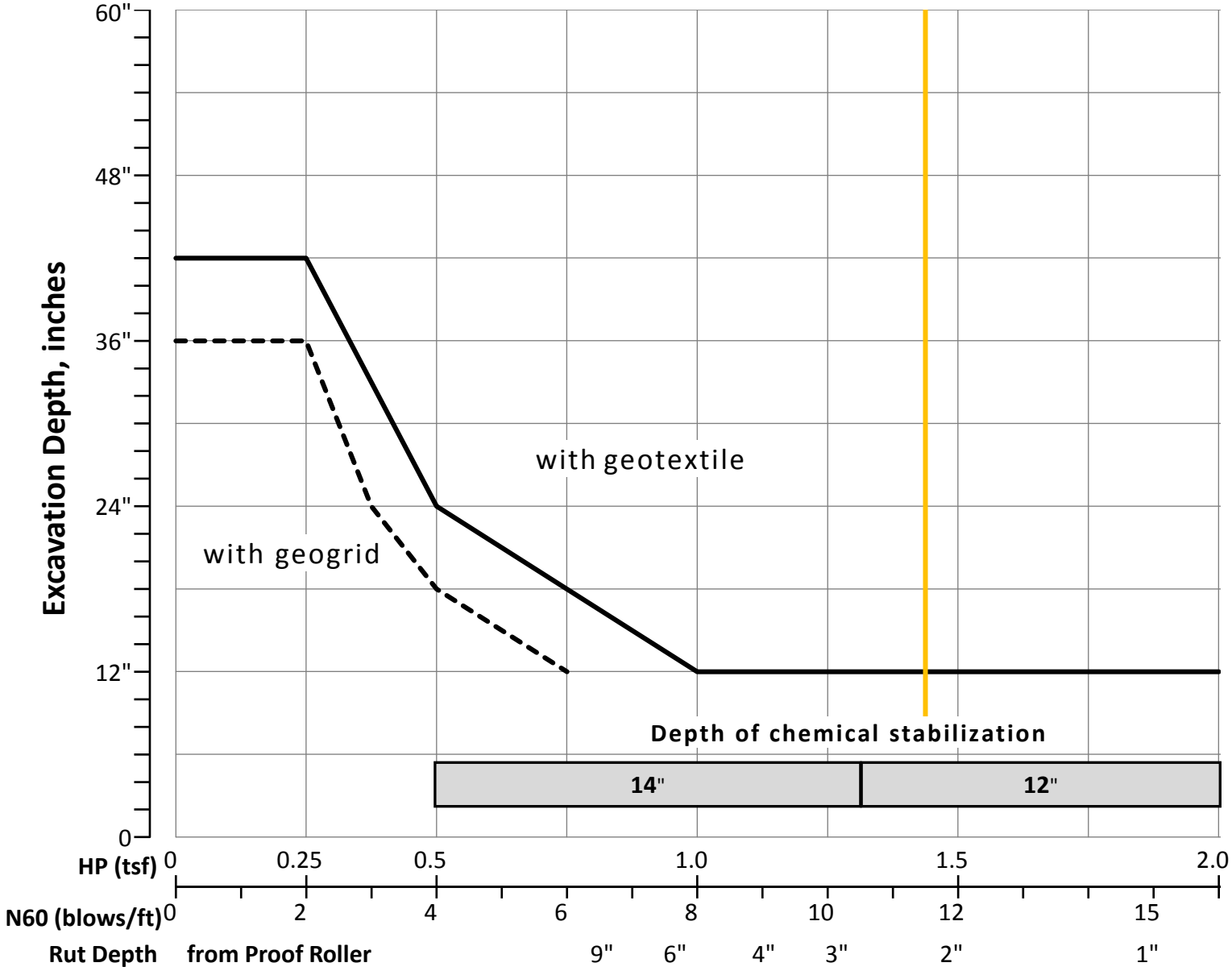
% Proposed Subgrade Surface	
Unstable & Unsuitable	75%
Unstable	75%
Unsuitable	0%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	18	12	3.69	25	16	9	33	16	49	15	11	4
Maximum	40	15	4.50	29	19	11	44	22	66	19	16	16
Minimum	5	5	1.75	22	14	6	20	10	30	11	6	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	1	0	4	0	0	0	0	1	6	0	0	3	1	0	0	0	0	16
Percent	0%	6%	0%	25%	0%	0%	0%	0%	6%	38%	0%	0%	19%	6%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	75%									25%								100%
Surface Class Count	0	0	0	2	0	0	0	0	0	5	0	0	1	0	0	0	0	0	8
Surface Class Percent	0%	0%	0%	25%	0%	0%	0%	0%	0%	63%	0%	0%	13%	0%	0%	0%	0%	0%	100%

GB1 Figure B – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
3.69		☐ HP
11.50		☐ N60L

Average HP
Average N_{60L}

APPENDIX G

$N1_{60}$ VALUES AND SOIL TYPE

Noise Wall
SUM-77-24.12 Ghent
PID: 111404

Depth of SPT (ft)	Correction Factor	B-007-0-20		Cohesive or Granular	B-073-0-20		Cohesive or Granular	B-074-0-20		Cohesive or Granular	B-075-0-20		Cohesive or Granular	B-076-0-20		Cohesive or Granular	B-077-0-20		Cohesive or Granular
		N_{60}	$N1_{60}$		N_{60}	$N1_{60}$		N_{60}	$N1_{60}$		N_{60}	$N1_{60}$		N_{60}	$N1_{60}$		N_{60}	$N1_{60}$	
3	1.56	18	-	Cohesive				10	16	Granular	16	-	Cohesive	15	23	Granular			
4	1.48				14	-	Cohesive										15	22	Granular
4.5	1.44	16	-	Cohesive				12	-	Cohesive				12	17	Granular			
6	1.32	20	-	Cohesive				8	-	Cohesive				11	15	Granular			
6.5	1.28				11	-	Cohesive				15	19	Granular				18	-	Cohesive
7.5	1.2	22	-	Cohesive				10	-	Cohesive				11	13	Granular			
9	1.14				12	-	Cohesive	14	-	Cohesive	8	9	Granular	18	21	Granular	20	-	Cohesive
11.5	1.1	15	-	Cohesive	8	-	Cohesive	11	-	Cohesive	10	11	Granular	19	21	Granular	30	-	Cohesive
14	1.04	15	-	Cohesive	10	-	Cohesive	10	10	Granular	19	20	Granular	18	19	Granular	29	30	Granular
16.5	0.976	8	-	Cohesive	14	14	Granular	8	8	Granular	26	25	Granular	10	10	Granular	22	21	Granular
19	0.93	7	6	Granular	14	13	Granular	10	9	Granular	16	15	Granular	12	11	Granular	14	13	Granular
21.5	0.892	27	24	Granular	10	9	Granular	18	16	Granular	19	17	Granular	8	7	Granular	15	13	Granular
24	0.856	26	22	Granular	14	12	Granular	10	9	Granular	23	20	Granular	12	10	Granular	22	19	Granular
26.5	0.816	29	24	Granular	14	11	Granular	11	9	Granular	27	22	Granular	11	9	Granular	25	20	Granular

Depth of SPT (ft)	Correction Factor	B-078-0-20		Cohesive or Granular
		N_{60}	$N1_{60}$	
3	1.56	18	-	Cohesive
4	1.48			
4.5	1.44	18	-	Cohesive
6	1.32	25	-	Cohesive
6.5	1.28			
7.5	1.2	26	-	Cohesive
9	1.14	25	-	Cohesive
11.5	1.1	25	-	Cohesive
14	1.04	27	-	Cohesive
16.5	0.976	14	14	Granular
19	0.93	19	18	Granular
21.5	0.892	15	13	Granular
24	0.856	20	17	Granular
26.5	0.816	18	15	Granular

APPENDIX H

DESIGN $N1_{60}$ VALUES BASED ON DRILLED SHAFT LENGTH

Noise Wall
SUM-77-24.12 Ghent
PID: 111404

	B-007-0-20		B-073-0-20		B-074-0-20		B-075-0-20		B-076-0-20		B-077-0-20		B-078-0-20	
Depth of Shaft (ft)	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**	Design $N1_{60}$	**Cohesive or Granular**
6	16	Cohesive	11	Cohesive	8	Cohesive	16	Granular	15	Granular	18	Granular	20 Avg.	Cohesive
8	16	Cohesive	11	Cohesive	8	Cohesive	9	Granular	13	Granular	18	Granular	22 Avg.	Cohesive
10	16	Cohesive	11	Cohesive	8	Cohesive	9	Granular	13	Granular	18	Granular	22 Avg.	Cohesive
12	15	Cohesive	8	Cohesive	8	Granular	9	Granular	13	Granular	18	Cohesive	23 Avg.	Cohesive
14	15	Cohesive	8	Cohesive	8	Granular	9	Granular	13	Granular	18	Granular	23 Avg.	Cohesive
16	8	Cohesive	8	Granular	8	Granular	9	Granular	10	Granular	18	Granular	14	Cohesive
18	6	Granular	8	Granular	8	Granular	9	Granular	10	Granular	13	Granular	14	Granular
20	6	Granular	8	Granular	8	Granular	9	Granular	7	Granular	13	Granular	13	Granular
22	6	Granular	8	Granular	8	Granular	9	Granular	7	Granular	13	Granular	13	Granular
24	6	Granular	8	Granular	8	Granular	9	Granular	7	Granular	13	Granular	13	Granular