
**SUBGRADE EXPLORATION REPORT
ROS-35/50-28.74/28.98
TRUCK PARKING SITE #6
ROSS COUNTY, OHIO
PID#: 122885**

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NEAS PROJECT 25-0060

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EXECUTIVE SUMMARY

The Ohio Department of Transportation (ODOT) has proposed a roadway improvement project, ROS-35/50-28.74/28.98, for Truck Parking Site #6 in Scioto Township, Ross County, Ohio. The project aims to develop construction plans for a new truck parking lot and associated facilities designed to accommodate WB-67 trucks.

National Engineering & Architectural Services, Inc. (NEAS) was contracted to perform geotechnical engineering services for the project. The purpose of these services was to perform geotechnical explorations within the project limits to obtain information on the subsurface soil and groundwater conditions relevant to the design and construction of the project. The scope of work performed by NEAS as part of the referenced project included: reviewing published geotechnical information; conducting 5 test borings for the proposed construction; conducting one pavement core, laboratory testing of soil samples in accordance with the SGE; performing geotechnical engineering analysis to assess subgrade stabilization requirements, pavement design parameters; and development of this summary report.

A subgrade exploration and subsequent analysis was completed for the referenced project. The exploration was conducted in general accordance with NEAS's proposal to ARCADIS US Inc., dated July 03, 2025, and with the provisions of ODOT's *Specifications for Geotechnical Explorations* (SGE) (ODOT [2], 2025). The subgrade analysis was performed in accordance with ODOT's Geotechnical Design Manual (ODOT [1], 2025) and Pavement Design Manual (PDM) (ODOT, 2025).

The subgrade conditions within the project area are relatively consistent, consisting of either existing pavement sections or topsoil underlain by both cohesive fine-grained and non-cohesive coarse-grained soils. The cohesive fine-grained soils are classified as A-4a, A-6a and A-6b, while the granular soils are classified as A-1-b and A-2-4.

According to our subgrade analysis, stabilization is unnecessary for this project. NEAS's opinion that the subgrade soils will provide adequate pavement support assuming it is designed and constructed in accordance with the recommendations provided within this report, as well as all applicable ODOT standards and specifications.

TABLE OF CONTENTS

1. INTRODUCTION.....	4
1.1. GENERAL	4
2. GEOLOGY AND OBSERVATIONS OF THE PROJECT	4
2.1. GEOLOGY AND PHYSIOGRAPHY	4
2.2. HYDROLOGY/HYDROGEOLOGY	5
2.3. MINING AND OIL/GAS PRODUCTION.....	5
2.4. HISTORICAL RECORDS AND PREVIOUS PHASES OF PROJECT EXPLORATION.....	5
2.5. FIELD RECONNAISSANCE	5
3. GEOTECHNICAL EXPLORATION.....	7
3.1. EXPLORATION PROGRAM.....	7
3.2. LABORATORY TESTING PROGRAM.....	8
3.2.1. Classification Testing.....	8
3.2.2. Standard Penetration Test Results	8
3.2.3. Sulfate testing.....	8
3.3. PAVEMENT CORING EXPLORATION PROGRAM.....	9
4. FINDINGS.....	9
4.1. EXISTING PAVEMENT	9
4.2. SUBGRADE CONDITIONS.....	10
4.2.1. Truck Parking Land.....	10
4.2.2. Groundwater	10
5. ANALYSES AND RECOMMENDATIONS.....	10
5.1. SUBGRADE ANALYSIS	11
5.1.1. Pavement Design Recommendations	11
5.1.2. Unsuitable Soils	11
5.1.2.1. Rock.....	11
5.1.2.2. Prohibited Soils.....	11
5.1.3. Unstable Soils	11
5.1.3.1. High Moisture Content Soils.....	12
5.2. STABILIZATION RECOMMENDATIONS.....	12
5.2.1. Subgrade Stabilization	12
6. QUALIFICATIONS	12

LIST OF TABLES

TABLE 1: PROJECT BORING INFORMATION	7
TABLE 2: SULFATE TEST SUMMARY BY BORING	8
TABLE 3: PAVEMENT CORE SUMMARY	9
TABLE 4: MEASURED PAVEMENT THICKNESS AT BORING LOCATIONS	9
TABLE 5: PAVEMENT DESIGN PARAMETERS.....	11

LIST OF APPENDICES

APPENDIX A: BORING PLAN
APPENDIX B: BORING LOGS
APPENDIX C: CALCULATIONS
APPENDIX D: PAVEMENT CORE LOGS

1. INTRODUCTION

1.1. General

National Engineering & Architectural Services, Inc. (NEAS) presents our Subgrade Exploration Report for the ROS-35/50-28.74/28.98 project for Truck Parking Site #6 in Ross County, Ohio. NEAS understands that ARCADIS US Inc. is collaborating with ODOT to develop construction plans for the new Truck Parking Site in Ross County, Ohio. This report presents a summary of the project encountered surficial and subsurface conditions and our recommendations for subgrade stabilization and pavement design parameters for the planned improvements. The pavement subgrade analysis and recommendations presented are in accordance with ODOT's *Geotechnical Design Manual* (GDM) (ODOT [1], 2025) and *Pavement Design Manual* (PDM) (ODOT, 2025).

The exploration was conducted in general accordance with NEAS's proposal to ARCADIS US Inc., dated July 03, 2025, and with the provisions of ODOT's *Specifications for Geotechnical Explorations* (SGE) (ODOT [2], 2025).

The scope of work performed by NEAS as part of the referenced project included: 1) a review of published geotechnical information; 2) performing 5 total test borings and 1 pavement core; 3) laboratory testing of collected samples in accordance with the SGE; 4) performing geotechnical engineering analysis to assess subgrade stabilization requirements and recommended pavement design parameters; and, 5) development of this summary report.

2. GEOLOGY AND OBSERVATIONS OF THE PROJECT

2.1. Geology and Physiography

The project site is located within the Illinoian Glaciated Allegheny Plateau, part of the Glaciated Allegheny Plateaus (ODGS, 1998). This is a moderate relief, dissected, rugged hilly area comprised of loess and older drift on ridgetops, but absent on bedrock slopes. Dissection is similar to unglaciated regions of the Allegheny Plateau. Soils in this region are characteristically colluvium and Illinoian-age till over Devonian-to Pennsylvanian-age shales, siltstones, and sandstones.

Based on the Quaternary geology map of Ohio, the overburden soils are generally made up of high-level outwash terraces (Kennard, Mount Vernon, Vanatta levels) consisting of sand and gravel deposits with 10 cm to 1 m of silt or loess.

Based on the Bedrock Geologic Units Map of Ohio (USGS & ODGS, 2006), bedrock within the project area consists of shale of the Ohio Shale Group. This Devonian-age shale can be described as carbonaceous to clayey, laminated to thin bedded with fissile parting, petroliferous odor, and brownish black to greenish gray in color, weathering to brown. This group includes the Olentangy Shale south of central Delaware County. Based on the ODNr bedrock topography map of Ohio, bedrock is relatively level throughout the project. Bedrock elevations at the project site can be expected at 500 ft above mean sea level (amsl), putting bedrock at depths ranging from 122.1 to 133.7 ft below ground surface (bgs).

The soils at the project site have been mapped (Web Soil Survey) by the Natural Resources Conservation Service (USDA, 2024) as mainly Eldean loam. Soils in the Eldean series are characterized as very deep, well drained soils that are moderately deep to calcareous sandy and gravelly material. They are formed in outwash materials dominantly of limestone origin on outwash terraces, kames, and moraines. In some areas, the upper part of the soil developed in silty or loamy alluvium or in loess. The Eldean loam series is

Subgrade Exploration Report
ROS-35/50-28.74/28.98 Truck Parking Site # 6
PID #: 12285
Ross County, Ohio

comprised of coarse- and fine-grained soils and classified as A-1-b, A-6, A-7, and A-7-6 according to the AASHTO method of soil classification.

2.2. Hydrology/Hydrogeology

Groundwater at the project site can be expected at an elevation consistent with that of the nearby Scioto River as it is the most dominant hydraulic influence in the vicinity of the project's boundaries. The water level of the Scioto River may be generally representative of the local groundwater table. However, it should be noted that perched groundwater systems may be existent in areas due to the presence of fine-grained soils making it difficult for groundwater to permeate to the phreatic surface.

The project site is not located within a regulatory flood hazard area based on available mapping by the Federal Emergency Management Agency's (FEMA) National Flood Hazard mapping program (FEMA, 2024).

2.3. Mining and Oil/Gas Production

Active mine (ID IM-2099) was noted on ODNR's Mines of Ohio Locator located 294 feet south-west from the Truck Parking site (ODNR [1], 2024).

No oil or gas wells were noted on ODNR's Oil and Gas Well Locator in the vicinity of the project site (ODNR [1], 2024).

2.4. Historical Records and Previous Phases of Project Exploration

A historic record search was performed through ODOT's Transportation Information Mapping System (TIMS). Various sets of reports/plans as well as the associated historical geotechnical documents were reviewed, however, the available information was not utilized for our evaluation of the site.

2.5. Field Reconnaissance

A field reconnaissance visit for the overall project was conducted on September 17, 2025, within the project limits. Site conditions, including the existing land conditions and pavement conditions, were noted and photographed during the visit. Photographs of notable features and a summary of our observations are provided below. The land use of most of the project area consists of ODOT ROW (Right of Way), commercial properties, and agricultural farmland.

The pavement within the project area were observed to be in fair to poor condition at the time of reconnaissance, exhibiting some signs of weathering and surface wear. Extensive high severity longitudinal, block, transverse, and edge cracking were observed, along with frequent high severity raveling along the access road (Photograph 1). The truck parking area was covered with tall grasses, shrubs, and young deciduous trees (Photograph 2). The embankments along the US Route 35 westbound exit ramp and US Route 50, slope downward at a 3:1 grade into a drainage ditch (Photograph 3), the terrain then rises slightly before descending again at a 5H:1V slope towards the project site. The embankment slopes north and south of the access road range from 5H:1V to generally flat lying with the surrounding landscape. At the time of the site visit, the drainage ditch was clear and unobstructed, with no evidence of standing water. No signs of geotechnical instability were observed within project limits at the time of our reconnaissance.

Subgrade Exploration Report
ROS-35/50-28.74/28.98 Truck Parking Site # 6
PID #: 12285
Ross County, Ohio

Photograph 1: Pavement conditions



Photograph 2: Truck Parking



Photograph 3: Drainage Ditch



Photograph 4: Embankment Slope



3. GEOTECHNICAL EXPLORATION

3.1. Exploration Program

The subsurface exploration was conducted by NEAS on August 08, 2025, which included 5 borings drilled to depths between 7.5 and 10.5 ft below ground surface (bgs). The boring locations were selected by NEAS in general accordance with the guidelines contained in the SGE with the intent to evaluate subgrade soil and groundwater conditions. Borings were located within the project area planned to be constructed that were not restricted by underground utilities or dictated terrain (i.e., steep embankment slopes). Boring information: (Latitude/ Longitude, Elevation) as shown on Table 1 below.

Table 1: Project Boring Information

Boring Number	Easting	Northing	Latitude	Longitude	Elevation (ft)	Depth (ft)
B-001-0-25	1853080.325	473006.112	39.297983	-82.907855	631.5	7.5
B-002-0-25	1853105.952	473195.182	39.298502	-82.907767	622.1	10.5
B-003-0-25	1853043.076	473395.943	39.299053	-82.907993	633.7	7.5
B-004-0-25	1852921.452	473196.609	39.298504	-82.908419	625.5	7.5
B-005-0-25	1853283.548	473179.892	39.298462	-82.907139	631.5	7.5
Notes: 1. All boring locations were staked and surveyed in the field by NEAS.						

Borings were drilled using a CME 45B truck-mounted drilling rigs utilizing 2.25-inch (inner diameter) hollow stem augers. Soil samples for subgrade borings were typically recovered continuously to end of boring depth (EOB). Each boring was sampled using an 18-inch split spoon sampler (AASHTO T-206 “Standard Method for Penetration Test and Split Barrel Sampling of Soils.”). The soil samples obtained from the exploration program were visually observed in the field by NEAS field representative and preserved for review by a geologist for possible laboratory testing. Standard penetration tests (SPT) were conducted using a CME auto hammer that has been calibrated on March 08, 2024, to be 79 % efficient as indicated on the boring logs (Appendix B).

Field boring logs were prepared by drilling personnel and included pavement description, 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). After completing the

Subgrade Exploration Report
ROS-35/50-28.74/28.98 Truck Parking Site # 6
PID #: 12285
Ross County, Ohio

borings, the boreholes were backfilled with either auger cuttings, or a combination of these materials and patched accordingly with cold patch asphalt when drilling through the roadway.

3.2. Laboratory Testing Program

The laboratory testing program consisted of classification testing, moisture content and sulfate content determinations. Data from the laboratory testing program were incorporated on the boring logs (Appendix B).

3.2.1. Classification Testing

Representative soil samples were selected for index properties (Atterberg limits) and gradation testing for classification purposes. At each boring location, the upper two samples obtained below the proposed top of subgrade elevation were generally tested while additional samples in each boring 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 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 B.

3.2.2. Standard Penetration Test Results

Standard Penetration Tests (SPT) and split-barrel (commonly known as split-spoon) sampling of soils were performed at 1.5-ft interval 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 B.

3.2.3. Sulfate testing

Sulfate testing was generally performed on one sample from 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 2 below, and presented on the boring logs within Appendix B.

Table 2: Sulfate Test Summary by Boring

Boring ID	Sample	Depth (ft)	Dilution Ratio	Average Sulfate Content (ppm)
B-001-0-25	SS-1	1.5 - 3.0	20	0
B-002-0-25	SS-1	1.5 - 3.0	20	0
B-003-0-25	SS-1	1.5 - 3.0	20	7
B-004-0-25	SS-1	1.5 - 3.0	20	0
B-005-0-25	SS-1	1.5 - 3.0	20	0

3.3. Pavement Coring Exploration Program

The coring exploration program for this project was conducted by NEAS and included one pavement core. Measurements, location information, photographs, and other details of the core sample can be found in the Pavement Core Log included within Appendix D. The approximate location for the core are depicted on the Boring Location Plan provided in Appendix A. A summary of these measurements is provided in Table 3 below.

Core was drilled using a portable electric powered coring drill with a 4-inch (outer diameter) diamond tipped drill bit and utilizing water as the circulating fluid. Asphalt thickness was measured in the field after the core was extracted and down-hole measurements were made. Core 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 asphalt patch. Once in the laboratory the core was: 1) remeasured for thickness verification and photographed; 2) checked for composition; and, 3) reviewed for individual layer identification and subsequent measurements.

Table 3: Pavement Core Summary

Boring ID	Proposed Alignment	Core Diameter (in)	Asphalt Thickness (in)	Total Thickness (in)
X-001-0-25	Access Road	3.75	4.00	4.00

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 B. 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. 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. 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 B. A summary of these measurements is provided in Table 4 below.

Table 4: Measured Pavement Thickness at Boring Locations

Boring ID	Asphalt Thickness (in)	Concrete Thickness (in)	Base Thickness (in)	Total Thickness (in)
B-001-0-25	6.0	0.0	0.0	6.0

4.2. Subgrade Conditions

The subgrade conditions in the project area are relatively consistent, consisting primarily of either existing pavement sections or topsoil underlain by cohesive fine-grained, cohesive coarse-grained, and granular soils. The cohesive fine-grained soils are classified as A-6a and A-6b, while the cohesive coarse-grained are described as A-4a. Meanwhile, granular soils are classified as A-1-b and A-2-4. A summary of the subgrade conditions encountered along the project site is provided below.

4.2.1. Truck Parking Lot

This section consists of all 5 borings. Thirty percent (30%) of the samples taken were classified as cohesive fine-grained soils and were comprised of: 1) Silt and Clay (A-6a, 5% of the samples); and 2) Silty Clay (A-6b, 25% of the samples). In terms of consistency of the cohesive soils, the description varies from stiff to very stiff correlating to converted SPT-N values (N_{60}) ranging from 8 blows per foot (bpf) to 13 bpf. Natural moisture contents ranged from 16 to 19 percent. Based on Atterberg limits test performed on representative samples of the cohesive soils, the liquid and plastic limit were estimated to range from 31 to 33 percent and from 15 to 19 percent, respectively.

Five percent (5%) of the samples taken were classified as cohesive coarse-grained soils and consisted of Sandy Silt (A-4a, one sample). Regarding the consistency of the sample, the description of the sample is stiff correlating to converted SPT-N values (N_{60}) of 11 bpf. The natural moisture content is 14 percent. Based on Atterberg limits test performed on representative sample of the cohesive coarse-grained soils, the liquid limit and plastic limit were estimated to be 22 percent and 16 percent, respectively.

Sixty-five percent (65%) of the samples taken were classified as granular soils and were comprised of: 1) Gravel and with Sand (A-1-b, 45% of the samples); and 2) Gravel and with Sand and Silt (A-2-4, 20% of the samples). In terms of relative compactness of the granular soils, the description varies from medium dense to dense correlating to converted SPT-N values (N_{60}) ranging from 14 bpf to 33 bpf. Natural moisture contents ranged from 3 to 11 percent

4.2.2. Groundwater

Groundwater measurements were taken during the boring drilling procedures and/or immediately following the completion of each borehole. Groundwater was not encountered during drilling or after drilling as part of the project.

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.

5. ANALYSES AND RECOMMENDATIONS

NEAS understands that ARCADIS US Inc. is working with the ODOT to develop construction plans for the new Truck Parking Site #6 in Ross County, Ohio. The subgrade exploration and subsequent analyses were completed for the referenced project. The subgrade analysis was performed in accordance with ODOT's GDM Section 600 criteria utilizing the ODOT provided: Roadway Subgrade Analysis Spreadsheet (Version 14.81 dated July 21, 2025). Input information for the spreadsheet was based on the soil characteristics gathered during NEAS's exploration (i.e., SPT results, laboratory test results, etc.).

5.1. Subgrade Analysis

Subgrade analyses were 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 subgrade analyses including pavement design parameters and unsuitable subgrade conditions identified within the project limits. Subgrade analysis spreadsheets are provided in Appendix C.

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 extending to a depth of 7.5 ft below the bottom of proposed pavement section (i.e., top of subgrade).

5.1.1. Pavement Design Recommendations

It is our understanding that pavement analysis and design is to be performed to determine the proposed pavement section within the project limits to undergo the proposed improvements. A subgrade analysis was performed using the subgrade soil data obtained during our field exploration program to evaluate the soil characteristics to develop pavement parameters for use in pavement design. The subgrade analysis parameters recommended for use in pavement design are presented in Table 5 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 5: Pavement Design Parameters

VAR-STW-Truck Parking SE Ohio Site #6 Subgrade Analysis Summary					
Segment	Maximum N_{60L}	Minimum N_{60L}	Average N_{60L}	Average PI Values	Design CBR
Truck Parking Site	30	8	17	13	11

5.1.2. Unsuitable Soils

Per ODOT's GDM, the presence of select subgrade conditions are prohibited within the subgrade zone for new pavement construction. These prohibited subgrade conditions generally include the presence of rock, specific soil types, and soils with a liquid limit greater than 65 percent. With respect to the proposed improvement project these subgrade conditions are further discussed in the following subsections.

5.1.2.1. Rock

Rock was not encountered within the top 6 inches of the proposed grade in both borings performed; therefore, no specialized remediation efforts are required.

5.1.2.2. Prohibited Soils

Prohibited soil types per the GDM include A-4b, A-2-5, A-5, A-7-5, A-8a, A-8b, and soils with liquid limits greater than 65. No prohibited soils were encountered in any boring along the project limits.

5.1.3. Unstable Soils

The GDM recommends subgrade stabilization for soils 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 subgrade analysis recommends a depth of subgrade stabilization for ODOT standard stabilization methods. For the purposes of this report, the term 'weak soils' has been assumed to represent subgrade soils of these conditions. It should be noted that although a soil

Subgrade Exploration Report
ROS-35/50-28.74/28.98 Truck Parking Site # 6
PID #: 12285
Ross County, Ohio

sample's N_{60} value may meet the criteria to be considered a weak soil, the depth in which the weak soil is encountered in relation to the proposed subgrade is considered when each individual subgrade boring is analyzed. For example, if the GDM 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. However, no weak soils were encountered in any of the borings performed within project limits.

5.1.3.1. High Moisture Content Soils

High moisture content soils are defined by the GDM as soils that exceed the estimated optimum moisture content (per *Figure A - Optimum Moisture Content* within the GDM) for a given classification by 3 percent or more. Per the GDM, 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 weak 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. Based on the subsurface exploration performed, no high moisture content soils were encountered within the proposed subgrade of the project in any of the borings.

5.2. Stabilization Recommendations

5.2.1. Subgrade Stabilization

According to our subgrade analysis, stabilization is unnecessary for this project. NEAS's opinion that the subgrade soils will provide adequate pavement support assuming it is designed and constructed in accordance with the recommendations provided within this report, as well as all applicable ODOT standards and specifications.

6. QUALIFICATIONS

The investigation was performed in accordance with accepted geotechnical engineering practice for the purpose of characterizing the subsurface and groundwater within the project limits. This report has been prepared for ARCADIS US Inc. and their design consultants to be used solely in evaluating the roadway subgrade and pavement design parameters that will serve as the basis for development of design and construction of the roadway improvement 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. If any changes occur in the nature, design or location of the proposed roadway, 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.

Subgrade Exploration Report
ROS-35/50-28.74/28.98 Truck Parking Site # 6
PID #: 12285
Ross County, Ohio

It has been a pleasure to be of service to ARCADIS US Inc. in performing this geotechnical exploration for the ROS-35/50-28.74/28.98 Truck Parking Site #6 project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

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APPENDIX A

BORING PLAN

VAR-STW-Truck Parking SE Ohio Site #6

BORING PLAN

Legend

 BORING



Google Earth

Image © 2025 Airbus

APPENDIX B

BORING LOGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 9/25/25 08:05 - X:\1\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\VAR-STW TRUCK STOP #6\GINT FILES\VAR-STW TRUCK_STOP

PROJECT: VAR-STW-TRUCK PARKING #6		DRILLING FIRM / OPERATOR: NEAS INC. / RW				DRILL RIG: CME 45B				STATION / OFFSET: _____				EXPLORATION ID B-001-0-25							
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: NEAS INC. / NS				HAMMER: CME AUTOMATIC				ALIGNMENT: _____				PAGE 1 OF 1							
PID: 122866 SFN: _____		DRILLING METHOD: 2.25 HSA				CALIBRATION DATE: 3/8/24				ELEVATION: 631.5 (MSL) EOB: 7.5 ft.											
START: 8/8/25 END: 8/8/25		SAMPLING METHOD: SPT				ENERGY RATIO (%): 79				LAT / LONG: 39.297983, -82.907855											
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL
		631.5								GR	CS	FS	SI	CL	LL	PL	PI	WC			
6.0" ASPHALT (DRILLERS DESCRIPTION)		631.0																			
MEDIUM DENSE, BROWN, STONE FRAGMENTS WITH SAND AND SILT , LITTLE CLAY, DAMP (FILL)			1																		
			2		6																
			3		5	16	28	SS-1	-	20	23	23	23	11	NP	NP	NP	11	A-2-4 (0)	0	
		628.5	4		5																
STIFF, BROWN, SANDY SILT , LITTLE CLAY, TRACE GRAVEL, CONTAINS NO INTACT SOIL FOR HP READINGS, DAMP (FILL)		627.0	5		3	11	39	SS-2	-	6	18	27	36	13	22	16	6	14	A-4a (3)	-	
			6		3																
			7		2	8	56	SS-3	2.50	6	18	29	22	25	31	15	16	16	A-6b (4)	-	
VERY STIFF, BROWN, SILTY CLAY , "AND" SAND, TRACE GRAVEL, MOIST (FILL)					4																
		624.0	6		6																
			7		5	13	61	SS-4	2.25	-	-	-	-	-	-	-	-	17	A-6b (V)	-	
			EOB		5																
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.																					
ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS																					

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 9/25/25 08:05 - X:\1\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\VAR-STW TRUCK STOP #6\GINT FILES\VAR-STW TRUCK_STOP_STOF

PROJECT: VAR-STW-TRUCK PARKING #6		DRILLING FIRM / OPERATOR: NEAS INC. / RW		DRILL RIG: CME 45B		STATION / OFFSET: _____		EXPLORATION ID													
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: NEAS INC. / NS		HAMMER: CME AUTOMATIC		ALIGNMENT: _____		B-002-0-25													
PID: 122866 SFN: _____		DRILLING METHOD: 2.25 HSA		CALIBRATION DATE: 3/8/24		ELEVATION: 622.1 (MSL) EOB: 10.5 ft.		PAGE													
START: 8/8/25 END: 8/8/25		SAMPLING METHOD: SPT		ENERGY RATIO (%): 79		LAT / LONG: 39.298502, -82.907767		1 OF 1													
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS	SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL	
		622.1							GR	CS	FS	SI	CL	LL	PL	PI	WC				
VERY STIFF, BROWN, SILT AND CLAY, "AND" SAND, TRACE GRAVEL, DAMP (FILL)		619.1	1																		
			2	2	3	9	56	SS-1	2.50	3	17	20	37	23	32	19	13	17	A-6a (6)	0	
VERY STIFF, BROWN AND ORANGISH BROWN, SILTY CLAY, SOME SAND, TRACE TO LITTLE GRAVEL, DAMP TO MOIST (FILL)		611.6	3	2	4	9	67	SS-2	3.00	5	17	17	37	24	33	17	16	16	A-6b (8)	-	
			4	2	3	4	9	50	SS-3	3.25	-	-	-	-	-	-	-	16	A-6b (V)	-	
			5	1	3	4	9	50	SS-3	3.25	-	-	-	-	-	-	-	16	A-6b (V)	-	
			6	2	4	6	13	72	SS-4	2.75	-	-	-	-	-	-	-	19	A-6b (V)	-	
@7.5'; SS-5 CONTAINS ASPHALT FRAGMENTS			7	2	3	5	11	61	SS-5	2.50	-	-	-	-	-	-	-	24	A-6b (V)	-	
@9.0'; SS-6 CONTAINS ASPHALT FRAGMENTS			8	3	6	4	13	44	SS-6	2.50	-	-	-	-	-	-	-	18	A-6b (V)	-	
		9	3	6	4																
		10	4																		
		EOB																			
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.																					
ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS																					

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 9/25/25 08:05 - X:\1\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\VAR-STW TRUCK STOP #6\GINT FILES\VAR-STW TRUCK_STOP

PROJECT: VAR-STW-TRUCK PARKING #6		DRILLING FIRM / OPERATOR: NEAS INC. / RW				DRILL RIG: CME 45B				STATION / OFFSET: _____				EXPLORATION ID B-003-0-25									
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: NEAS INC. / NS				HAMMER: CME AUTOMATIC				ALIGNMENT: _____				PAGE 1 OF 1									
PID: 122866 SFN: _____		DRILLING METHOD: 2.25 HSA				CALIBRATION DATE: 3/8/24				ELEVATION: 633.7 (MSL) EOB: 7.5 ft.													
START: 8/8/25 END: 8/8/25		SAMPLING METHOD: SPT				ENERGY RATIO (%): 79				LAT / LONG: 39.299053, -82.907993													
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL		
		633.7								GR	CS	FS	SI	CL	LL	PL	PI	WC					
6.0" TOPSOIL (DRILLERS DESCRIPTION)		633.2																					
MEDIUM DENSE, BROWN, GRAVEL WITH SAND, TRACE TO LITTLE SILT, TRACE CLAY, DAMP (FILL)			1																				
			2	5	6	18	28	SS-1	-	35	42	11	9	3	NP	NP	NP	4	A-1-b (0)	7			
			3	3	6	20	28	SS-2	-	34	36	13	13	4	NP	NP	NP	4	A-1-b (0)	-			
			4	9																			
			5	3	7	17	22	SS-3	-	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	-		
			6	6																			
			7	7	8	20	28	SS-4	-	-	-	-	-	-	-	-	-	-	3	A-1-b (V)	-		
		626.2	EOB																				
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.																							
ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS																							

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 9/25/25 08:05 - X:\1\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\VAR-STW TRUCK STOP #6\GINT FILES\VAR-STW TRUCK_STOP

PROJECT: VAR-STW-TRUCK PARKING #6		DRILLING FIRM / OPERATOR: NEAS INC. / RW				DRILL RIG: CME 45B				STATION / OFFSET: _____				EXPLORATION ID B-004-0-25								
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: NEAS INC. / NS				HAMMER: CME AUTOMATIC				ALIGNMENT: _____				PAGE 1 OF 1								
PID: 122866 SFN: _____		DRILLING METHOD: 2.25 HSA				CALIBRATION DATE: 3/8/24				ELEVATION: 625.5 (MSL) EOB: 7.5 ft.												
START: 8/8/25 END: 8/8/25		SAMPLING METHOD: SPT				ENERGY RATIO (%): 79				LAT / LONG: 39.298504, -82.908419												
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL	
		625.5								GR	CS	FS	SI	CL	LL	PL	PI	WC				
6.0" TOPSOIL (DRILLERS DESCRIPTION)		625.0		1																		
DENSE, BROWN, GRAVEL WITH SAND, LITTLE SILT, TRACE CLAY, DAMP (FILL)				2	7	15	33	22	SS-1	-	41	21	16	15	7	NP	NP	NP	5	A-1-b (0)	0	
		622.5		3	7	10																
MEDIUM DENSE, BROWN, GRAVEL WITH SAND AND SILT, TRACE CLAY, DAMP (FILL)				4	10	10	26	50	SS-2	-	-	-	-	-	-	-	-	8	A-2-4 (V)	-		
				5	5	10																
				6	8	11	28	39	SS-3	-	26	22	18	29	5	NP	NP	NP	9	A-2-4 (0)	-	
		618.0		7	8	9	22	28	SS-4	-	-	-	-	-	-	-	-	6	A-2-4 (V)	-		
			EOB																			
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.																						
ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS																						

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT GDT - 9/25/25 08:05 - X:\1\ACTIVE PROJECTS\ACTIVE SOIL PROJECTS\VAR-STW TRUCK STOP #6\GINT FILES\VAR-STW TRUCK_STOP

PROJECT: VAR-STW-TRUCK PARKING #6		DRILLING FIRM / OPERATOR: NEAS INC. / RW				DRILL RIG: CME 45B				STATION / OFFSET: _____				EXPLORATION ID B-005-0-25							
TYPE: ROADWAY		SAMPLING FIRM / LOGGER: NEAS INC. / NS				HAMMER: CME AUTOMATIC				ALIGNMENT: _____				PAGE 1 OF 1							
PID: 122866 SFN: _____		DRILLING METHOD: 2.25 HSA				CALIBRATION DATE: 3/8/24				ELEVATION: 631.5 (MSL) EOB: 7.5 ft.											
START: 8/8/25 END: 8/8/25		SAMPLING METHOD: SPT				ENERGY RATIO (%): 79				LAT / LONG: 39.298462, -82.907139											
MATERIAL DESCRIPTION AND NOTES		ELEV.	DEPTHS		SPT/ RQD	N ₆₀	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%)					ATTERBERG				ODOT CLASS (GI)	SO4 ppm	BACK FILL
		631.5								GR	CS	FS	SI	CL	LL	PL	PI	WC			
6.0" TOPSOIL (DRILLERS DESCRIPTION)		631.0																			
MEDIUM DENSE, BROWN, GRAVEL WITH SAND, LITTLE SILT, TRACE CLAY, DAMP (FILL)			1																		
			2	5	6	14	22	SS-1	-	37	27	14	20	2	NP	NP	NP	4	A-1-b (0)	0	
			3	6	10	29	22	SS-2	-	26	35	22	14	3	NP	NP	NP	4	A-1-b (0)	-	
			4	12																	
			5	1	5	16	28	SS-3	-	-	-	-	-	-	-	-	-	3	A-1-b (V)	-	
			6	7																	
			7	8	20	33	SS-4	-	-	-	-	-	-	-	-	-	-	4	A-1-b (V)	-	
		624.0	EOB																		
NOTES: GROUNDWATER NOT ENCOUNTERED DURING DRILLING. HOLE DID NOT CAVE. DRILLED AS STAKED.																					
ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED 0.5 BAG HOLE PLUG; SHOVELED SOIL CUTTINGS																					

APPENDIX C

CALCULATIONS

ROADWAY SUBGRADE ANALYSIS

OHIO DEPARTMENT OF TRANSPORTATION**OFFICE OF GEOTECHNICAL ENGINEERING****PLAN SUBGRADES****Geotechnical Design Manual Section 600****VAR STW Truck Site 6****N/A****Development of construction plans for
the Truck Parking SE Ohio Site # 6 - Entire Project****NEAS, Inc.**

Prepared By: Momen Alassi, M.Sc., E.I.
Date prepared: Tuesday, September 16, 2025

Chunmei (Melinda) He, Ph.D., P.E.
2800 Corporate Exchange Drive
Suite 240
Columbus, OH 43231
614.714.0299 Ext 111
che@neasinc.com

NO. OF BORINGS: 5**NO. OF DCPS:**



#	Boring ID	Alignment	Station	Add DCP Test Data Worksheets				Boring EL.	Proposed Subgrade EL.	Cut Fill
				Offset	Dir	Drill Rig	ER			
1	B-001-0-25	Vertical				CME 45B	79	631.5	631.2	0.3 C
2	B-002-0-25	Vertical				CME 45B	79	622.1	633.0	10.9 F
3	B-003-0-25	Vertical				CME 45B	79	633.7	634.3	0.6 F
4	B-004-0-25	Horizontal				CME 45B	79	625.5	630.0	4.5 F
5	B-005-0-25	Horizontal				CME 45B	79	631.5	635.5	4.0 F



Y. 14.81

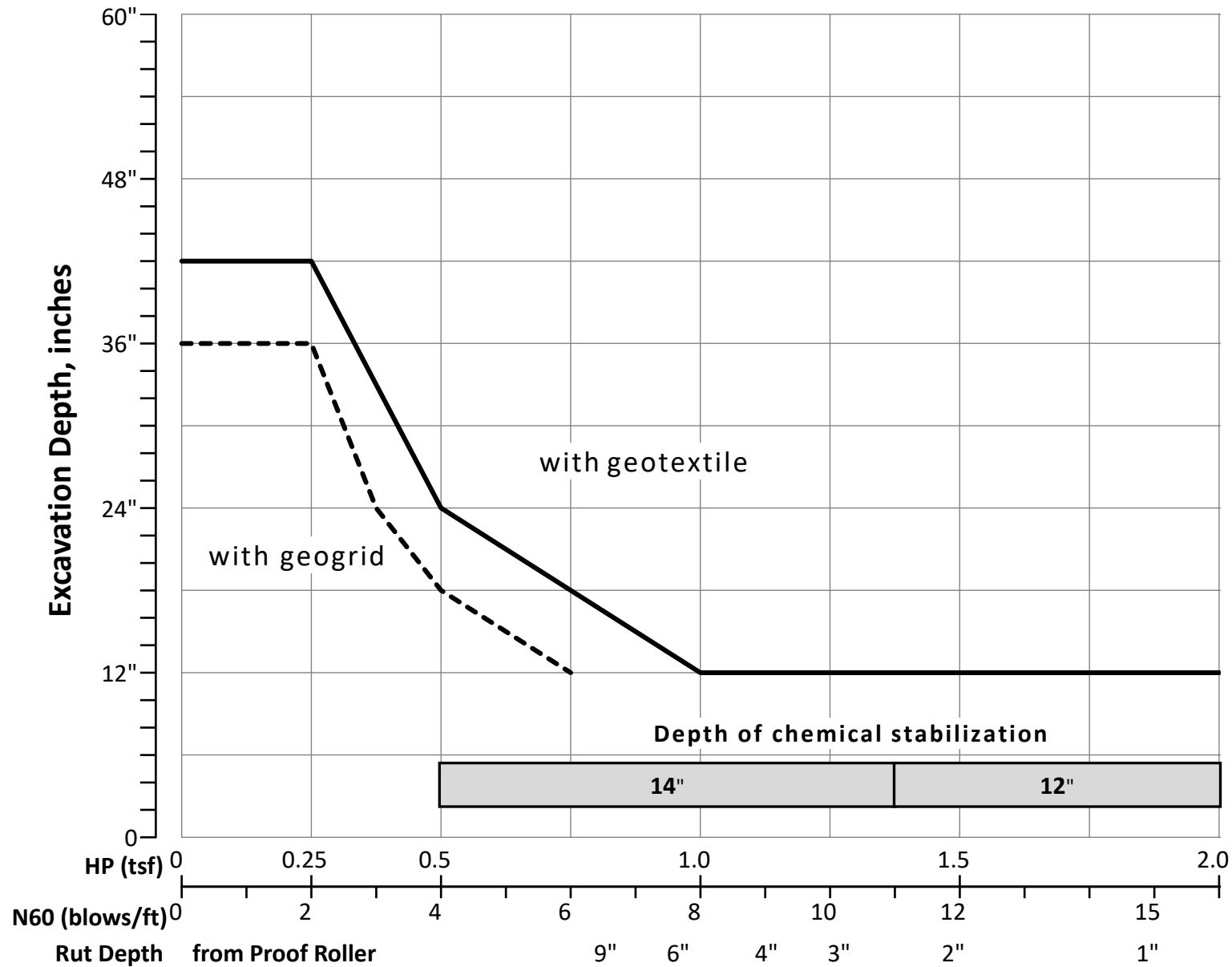
7/21/2025

#	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	1.2	2.7	16	8		NP	NP	NP	23	11	34	11	10	A-2-4	0	0					
		001-0	SS-2	3.0	4.5	2.7	4.2		11		22	16	6	36	13	49	14	11	A-4a	3					
	25	SS-3	4.5	6.0	4.2	5.7	8		2.5	31	15	16	22	25	47	16	16	A-6b	4						
		SS-4	6.0	7.5	5.7	7.2	13		2.25							17	16	A-6b							
2	B	SS-1	1.5	3.0	12.4	13.9	9		2.5	32	19	13	37	23	60	17	14	A-6a		0					
		002-0	SS-2	3.0	4.5	13.9	15.4		9	3	33	17	16	37	24	61	16	16	A-6b						
	25	SS-3	4.5	6.0	15.4	16.9	9		3.25							16	16	A-6b							
		SS-4	6.0	7.5	16.9	18.4	13		2.75							19	16	A-6b							
3	B	SS-1	1.5	3.0	2.1	3.6	18	17		NP	NP	NP	9	3	12	4	6	A-1-b	0	7					
		003-0	SS-2	3.0	4.5	3.6	5.1		20		NP	NP	NP	13	4	17	4	6	A-1-b	0					
	25	SS-3	4.5	6.0	5.1	6.6	17									4	6	A-1-b							
		SS-4	6.0	7.5	6.6	8.1	20									3	6	A-1-b							
4	B	SS-1	1.5	3.0	6.0	7.5	33	30		NP	NP	NP	15	7	22	5	6	A-1-b		0					
		004-0	SS-2	3.0	4.5	7.5	9.0		26							8	10	A-2-4							
	25	SS-3	4.5	6.0	9.0	10.5	28			NP	NP	NP	29	5	34	9	10	A-2-4							
		SS-4	6.0	7.5	10.5	12.0	22									6	10	A-2-4							
5	B	SS-1	1.5	3.0	5.5	7.0	14	14		NP	NP	NP	20	2	22	4	6	A-1-b		0					
		005-0	SS-2	3.0	4.5	7.0	8.5		29		NP	NP	NP	14	3	17	4	6	A-1-b						
	25	SS-3	4.5	6.0	8.5	10.0	16									3	6	A-1-b							
		SS-4	6.0	7.5	10.0	11.5	20									4	6	A-1-b							

Date prepared: 9/16/2025

[illegible]

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
2.71	0.50	<input type="checkbox"/> HP
17.25	6.00	<input type="checkbox"/> N60L

Average HP

Average N_{60L}



APPENDIX D

PAVEMENT CORE LOGS

Core Photo: X-001-0-25



Latitude: 39.297974 Longitude: -82.907846

Core Information				
Core Diameter (in):			3.75	
Core Total Length (in):			4	
Layers	Core Composition & Thickness (in)			Remarks/ Condition
	Asphalt	Concrete	Brick	
1	4			Poor
2				
3				
4				
Rebar Encountered	n/a			

Pavement & Core Photo Log

Roadway Project

VAR-STW-Truck Parking #6

NEAS Project No.: 25-0060
Date: 8/29/2025
Taken By: LR
Scale: N/A

