GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.

SUBGRADE EXPLORATION REPORT

PROPOSED ROADWAY IMPROVEMENTS
WEST WOOSTER ROAD
PID: 108240
CITY OF BARBERTON, OHIO

Prepared For:

The City of Barberton, Ohio

Attention:

David Neumeyer, PE

GPD Project No. 2022177.02 Rev.4
August 29, 2023

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Contents

Executive Summary

The project involves field exploration and pavement recommendations for the proposed roadway improvements of West Wooster Road between Hudson Run Road and 4th Street NW. The test borings for this exploration were advance within the proposed right-of-way by GPD Group.

A total of eighteen (18) borings were performed along West Wooster Road between February 08, 2022 and February 10, 2022. The test borings were drilled to depths of about seven (7) feet below existing grades. In summary, the eighteen (18) borings consisted of the following:

Boring B-001-0-22 through B-018-22, drilled within the existing roadway, encountered varying thicknesses of asphalt underlain by brick and/or granular base/slag as outlined in Table 1. Below the asphalt/brick and granular base, the subsoils generally consisted of very loose to dense gravel and silt with varying amounts of fine sand. N_{60}-values ranged from 2 to 50+ blows per foot indicative of a very loose to dense consistency. The water content in this upper stratum ranged from about 6 to 26 percent with percent fines ranging from about 8 to greater than 50 percent. Borings were terminated at approximately 7 feet below existing grades.

The results of the laboratory tests and GB1 analysis indicate that the CBR value of 11 can be utilized for the design of the proposed pavement structures. The above summary is intended to convey primary issues we believe are associated with this site. This report must be read in its entirety for a full description of our geotechnical recommendations

SECTION 1

1.0 Introduction

Based on provided information, it is GPD's understanding that the project will consist of the following:

West Wooster Road: Based on the provided information, it is understood that the proposed project will include reconstruction of West Wooster Road between 3rd Street NW and Hudson Run Road in the City of Barberton (Summit County), Ohio. The proposed roadway reconstruction will be about 1.4 miles long. The proposed roadway reconstruction will follow the same alignments of the existing roadway with expected cuts ranging from about 0.7 to 1.5 feet below existing grades.

The geotechnical recommendations presented in this report are based on the available project information. In the event changes in the project design occur, GPD Group must review this report to determine if modifications to our recommendations are warranted.

1.1 Geology and Observations

The United States Department of Agriculture ("USDA") Soil Survey of Summit County, Ohio, and the United States Geological Survey ("USGS") maps were reviewed to assess the subsurface geology and sedimentary makeup of the site location, as well as the topography of the region. The surrounding area is comprised of an urban landscape with a mixture of residential and commercial properties. Elevations of the proposed roadway alignment ranges from about 1005 to 966 feet above sea level based on recent aerial images. The frost depth in this region is 32 inches per NAVFAC DM 7.01. According to the USDA, the surficial soils in this area consist primarily of Chili-Urban fill compressed of gravelly sand and gravelly sandy loam.

According to the Ohio Department of Natural Resources (ODNR) the bedrock underlying the project area is called the Cuyahoga Formation and is comprised of shale sedimentary rock. No underground or aboveground mines are reported in the vicinity of the project area.

The existing pavement section along the project alignment consisted of about 2.5 to 11.0 inches of flexible asphalt pavement underlain by 0 to 8.0 inches of brick. The brick stratum is underlain by granular aggregate base ranging in thicknesses from 4 to 16.5 inches. The majority of the pavement appears to have experienced varies levels of block cracking, longitudinal and latitudinal joint cracking and areas of fatigue cracking.

1.2 Subsurface Exploration Program

1.2.1 Historical Borings Referenced

No historical boring information was available within the project limits

1.2.2 Field Drilling and Coring Operations

The subsurface exploration consisted of drilling and sampling eighteen (18) borings along the West Wooster Roadway alignment to depths of about 7 feet below existing grades. The boring and coring locations were laid out by GPD personnel using a handheld GPS device. The locations of the borings and pavement cores should be considered accurate only to the degree implied by the means and methods used to define them.

The borings were drilled with a track-mounted Geoprobe 7822 DT rotary drill rig using hollow-stem augers and an automatic SPT hammer to advance the boreholes. Representative samples were obtained by the split-barrel sampling procedure in general accordance with the appropriate ASTM standards. In the split-barrel sampling procedure, the number of blows required to advance a standard 2-inch O.D. split-barrel sampler the middle 12 inches of the typical total 24-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N-Value). This value is used to estimate the in-situ relative density of cohesion-less soils and the consistency of cohesive soils. The sampling depths and penetration distance, plus the standard penetration resistance values, are shown on the boring logs. The samples were sealed and returned to the laboratory for testing and classification.

An automatic SPT hammer with a calibrated energy efficiency of 91.2 percent was used to advance the split-barrel sampler in the borings performed for this site. The efficiency was adjusted to 90 percent per ODOT specifications. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the standard penetration resistance blow count (N) values. The effect of the automatic hammer's efficiency, equating to the reported N_{60}-value, has been considered in the interpretation and analysis of the subsurface information for this report.

Field logs of each boring were prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent an interpretation of the field logs and include modifications based on observations made by a Geotechnical Engineer and the results of laboratory testing.

1.3 Laboratory Testing

The samples were classified in the laboratory based on visual observation, texture and plasticity. The descriptions of the soils indicated on the boring logs are in accordance with the enclosed General Notes and the ODOT Modified AASHTO method. Calculated ODOT Group Indexes are given on the boring logs. A brief description of this classification system is attached to this report.

The laboratory testing program consisted of performing the following tests:

- Natural water content tests (ASTM D 2216 / AASHTO T-265)
- Liquid Limits (ASTM D 4318 / AASHTO T-89)
- Plastic Limits (ASTM D 4318 / AASHTO T-90)
- Particle Size Analysis (ASTM D 422 / AASHTO T-88)
- Sulfate Content (ODOT SS1122)

Information from these tests was used in conjunction with field penetration test data to evaluate soil strength in-situ, volume change potential, and soil classification. Results of these tests are attached and provided on the boring logs.

SECTION 2

2.0 Findings

2.1 Subsurface Conditions – West Wooster Road

Borings B-001-0-22 through B-018-0-22, drilled within the existing roadway, encountered varying thicknesses of asphalt underlain by brick and/or granular base/slag as outlined in Table 1. Below the asphalt/brick and granular base, the subsoils generally consisted of very loose to dense gravel and silt with varying amounts of fine sand. N_{60}-values ranged from 2 to 50+ blows per foot indicative of a very loose to dense consistency. The water content in this upper stratum ranged from about 6 to 26 percent with percent fines ranging from about 8 to greater than 50 percent. Borings were terminated at approximately 7 feet below existing grades. At B-011-0-22 very soft, black and gray clay with organics was present below about 5 feet.

2.1.1 Groundwater Conditions

Groundwater was not observed in the borings during or immediately after completion of drilling operations. At the time the borings were drilled, the groundwater table at the boring locations was apparently below the maximum drilling depth. However, fluctuations in the groundwater table can occur and perched water can develop over low permeability soil or rock strata following periods of heavy or prolonged precipitation. This possibility should be considered when developing design and construction plans and specifications for the project. Long term monitoring in cased holes or piezometers would be necessary to accurately evaluate the potential range of groundwater conditions on the site.

2.2 Roadway Core Results – West Wooster Road

The composition and approximate thickness of the existing surface materials, pavement and base materials encountered at core locations along West Wooster Road are listed in Table 1:

Table 1: Approximate Pavement Thickness

Boring/Coring ID	Asphalt Thickness (in)	Brick Thickness[1] (in)	Granular base Thickness (in)
B-001-0-22	4.50	8.00	4.00
B-002-0-22	11.50	n/a	4.00
B-003-0-22	3.75	3.50	6.0
B-004-0-22	3.50	3.50	14.00
B-005-0-22	3.0	3.50	9.0
B-006-0-22	4.00	3.75	10.00
B-007-0-22	2.50	4.00	15.00
B-008-0-22	4.00	3.50	16.50
B-009-0-22	4.00	7.50	16.00
B-010-0-22	3.50	3.50	9.00
B-011-0-22	4.25	4.00	9.75
B-012-0-22	4.50	3.50	6.00
B-013-0-22	8.00	n/a	8.50

Boring/Coring ID	Asphalt Thickness (in)	Brick Thickness[1] (in)	Granular base Thickness (in)
B-014-0-22	5.00	3.50	5.50
B-015-0-22	5.00	n/a	7.00
B-016-0-22	5.50	n/a	6.00
B-017-0-22	5.50	n/a	n/a
B-018-0-22	7.00	n/a	6.00

***Note[1]**: Red Brick, most likely left in-place from the prior roadway, was encountered below the HMA surface*

Section 3

3.0 Evaluation and Recommendations

The following engineering recommendations are based on information provided to GPD Group regarding the design of the proposed roadway extension, the field and laboratory testing performed on the soil encountered at this site, and other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, GPD should be immediately notified so that further evaluation and supplemental recommendations can be provided.

3.1 Site Preparation and Earthwork Operations

It is recommended that all site preparation and earthwork operations be conducted in accordance with the following generalized procedures:

All vegetation, topsoil, tree roots, organic-containing soils, and any soft or otherwise unsuitable materials should be fully removed from the site. Subsequent to stripping and rough grading; proof-rolling with heavy construction equipment such as a loaded tandem axle dump truck is recommended in fill and/or cut areas to aid in locating unstable subgrade materials. Any unstable materials located during proof rolling should be removed and replaced with suitable compacted fill material under the direct supervision of the onsite Geotechnical Engineer or their representative.

During our investigation there were four (4) boring locations which encountered a material found to be unstable (A-4b) or best described as Uncontrolled Fill (UCF). These conditions were encountered at locations B-002, B-012, B-014, and B-016. These locations encountered granular, non-cohesive, slag and fill soils near the surface likely related to construction of the roadway. We are recommending a cut depth of approximately 36" for these areas to reach stable native soils beneath. Table 2 below shows the anticipated undercut quantities for these areas.

Table 2: Approximate Undercut Quantities

Boring ID	Boring Station	Approximate Undercut Station Limits		Undercut Depth	Undercut Width	204 Undercut Volume	204 Geotextile Fabric
		From	To	(in)	(ft)	(Cu. Yd.)	(Sq. Yd.)
B-002-0-22	307+64	305+25	309+80	36	37	1871	1871
B-012-0-22	347+77	345+60	349+12	36	37	1448	1448
B-014-0-22	365+18	353+50	357+60	36	37	1686	1686
B-016-0-22	364+16	362+05	366+50	36	37	1830	1830
Estimated Undercut Quantities						6835	6835

ODOT's guidelines for Geotechnical Engineering and "*Subgrade Analysis Spreadsheet*," have been utilized as a guideline for development of the recommendations included in this report. Per ODOT requirements stated above, typically materials with in-situ moisture contents exceeding optimum moisture content by 3 percent or more, or materials exhibiting low SPT N_{60}-Values, require subgrade undercutting or stabilization to obtain adequate pavement support.

Based on ODOT's GB1, utilizing the test borings and laboratory results, ODOT guidelines, and our analysis, indicate that removal and replacement of the unsuitable and/or unstable soils to about 36 inches will be required below proposed grades at select locations. It should be noted that uncontrolled fill (UCF) was encountered in B-012-22, B-014-22 and B-016-22 to depths of about 3-ft below existing pavement surface. All uncontrolled fill should be undercut and properly backfilled with approved material. In general, the estimated undercut limits of this material can be anticipated from STA 345+60 through STA 349+12, from STA 345+60 through STA 349+12, and STA 362+05 through STA 366+50 respectively. This information is also provided in the Table 2 above. A-4b soils were encountered in B-002-22 to a depth of about five (5) feet below existing grade. According to Section 610.1 of the GDM, this material should be undercut to a depth of 36 inches and backfilled with approved material as discussed herein. Based on the boring performed, it is estimated the general limits of A-4b material removal will likely extend from STA 305+25 through STA 309+80. Refer to the *Subgrade Analysis Spreadsheet* included in the Appendix A of this report for additional details.

3.1.1 Fill Material

Any fill or backfill required within construction limits should be select material, as approved by a qualified geotechnical engineer. For all filling operations, the following should be observed:

- Prior to use, the approved fill material should be tested as outlined in ASTM D-698 to determine the maximum dry density and optimum moisture content for silty or cohesive soils, or ASTM D-4253 and D-4254 for clean granular soils. For each change in borrow material, additional tests will be required.

- For all fill or backfill used, the fill material should be placed on the approved subgrade in controlled lifts, with each lift compacted to a stable condition, and to a minimum of 98% maximum dry density per ASTM D-698 at a moisture content within 1.5% of optimum for cohesive or silty borrow. Controlled lifts of granular material should be compacted to 80% relative density per ASTM D-4254.

- All filling operations should be observed by a qualified soils technician with field density tests made, to assure compaction to specification.

Proper moisture control of fine-grained silty soils is critical in attaining the required compaction. It should be noted that both in-situ soils and new fill composed of fine-grained soils are susceptible to disturbance by

construction equipment traffic when wet. Thus, construction operations should be planned to prevent such disturbance and the resulting weakening of the subgrade soils. Such precautions would include, but not be limited to grading the site to prevent ponding of water, sealing the subgrade soils at the end of operations each day, and allowing wet subgrades to dry before operating heavy equipment on exposed soil surfaces.

Compaction equipment and techniques will be dependent on the type of material being used as fill. A sheepsfoot roller should provide adequate compaction for cohesive (clayey) soils. A vibratory type compactor such as a drum roller will be required for non-cohesive (sandy) soils. It is our opinion that a vibratory drum roller would provide the most optimal compaction results for the on-site soils. A hand operated vibratory plate compactor should be used to compact backfill material within a 2-ft radial distance surrounding the pipes.

3.2 Pavement Design and Construction

Pavement design for the roadway structure will include proper preparation of subgrade sections, design of the pavement drainage systems and utilization of an adequate pavement section. It should be emphasized that an adequately design and installed permanent surface and subsurface drainage system is considered critical in maintaining proper base and subbase support to achieve the desired service life. It is recommended that the subsurface drainage system consist of perforated drain pipes bedded in and backfilled with suitable filter materials. The drainage system should be installed along either side of all roadways at an elevation, such that groundwater will be maintained a minimum of 3 feet below the top of the pavement structures. The filter around the drainage members is to terminate in direct contact with the aggregate base course for the pavements.

All subgrade sectors should be graded to direct water by gravity toward the drainage lines. At all low points and at regular intervals, lateral underdrain lines connected to suitably located outlet points are to be provided. Site surface grades should be such that no pavement sectors are allowed to impound water. All surface and subsurface water is to be directed to the existing or new storm sewer line or drainage ditches.

The results of the laboratory tests and GB1 analysis indicate that the **CBR value of 11** can be utilized for the design of the proposed pavement structures. In addition, all materials and field operations required for this project should follow recommendations and procedural details in accordance with the Ohio Department of Transportation guidelines and specifications.

3.3 Groundwater Control

At the time of this investigation, groundwater was not encountered. Any water encountered during the construction of this project would be the result of water bearing pervious seams, and/or a perched water table condition. Conventional dewatering methods, such as pumping from sumps, should be adequate for temporary removal of any groundwater encountered during excavation at the site. GPD should be notified in the event springs or other significant groundwater is exposed during the excavation process that cannot be controlled with conventional methods.

3.4 Excavations

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person" as defined in "CFR Part 1926," should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

If the excavations are left open and exposed to the elements for a significant length of time, desiccation of the clays may create minute shrinkage cracks which could allow large pieces of clay to collapse or slide into the excavation. Materials removed from the excavation should not be stockpiled immediately adjacent to the excavation, as this load may cause a sudden collapse of the embankment.

We are providing this information solely as a service to our client. GPD is not assuming responsibility for construction site safety or the contractor's activities; No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others.

3.5 Geohazard Considerations

Geohazards were not observed based on the results of the borings performed along the proposed roadway alignment.

3.6 General Comments

GPD Group should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Subsequent to initial grading, GPD should also be retained to provide testing and observation during site preparation and fill placement operations as well as during the pavement construction phases of the project.

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, GPD should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of **the City of Barberton, Ohio** for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report should not be considered valid unless GPD Group reviews the changes and either verifies or modifies the conclusions of this report in writing.

Appendix

Boring Location Plan

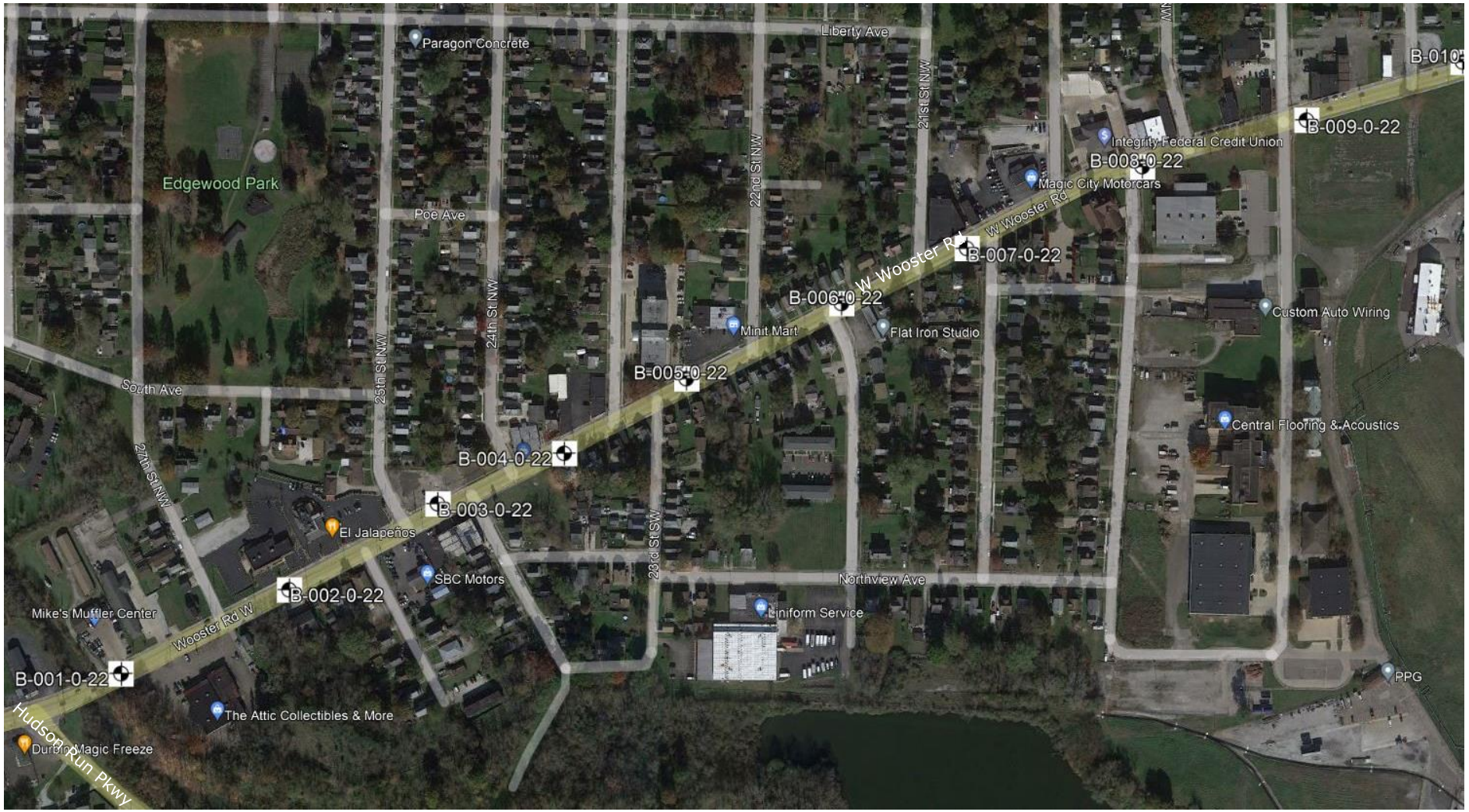
Pavement Core Results

Boring Logs

GB1 Subgrade Analysis Spreadsheet

ODOT General Notes

LOCATION PLAN 1



N

Legend

Soil Boring: ⊕

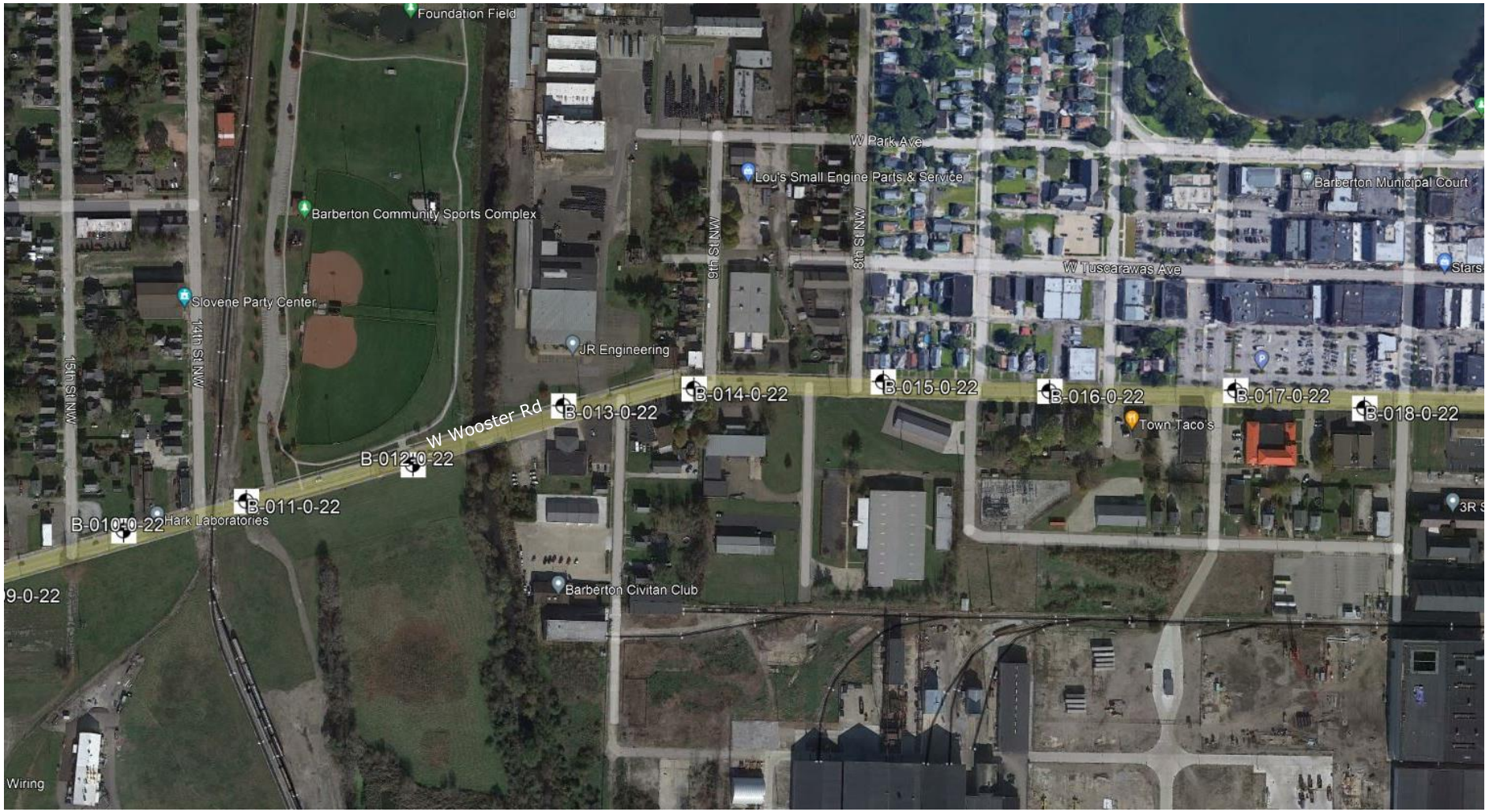
PROJECT: Wooster Rd W Rehabilitation, Barberton, OH

PROJECT NUMBER: 2021177.02 **DATE**: 2-11-2022

LOCATION: Wooster Rd W, Barberton, OH

520 S Main St, Suite 2531 Akron, Ohio 44311

LOCATION PLAN 2



N

Legend

Soil Boring: ⊕

PROJECT:	Wooster Rd W Rehabilitation, Barberton, OH
PROJECT NUMBER:	2021177.02 **DATE**: 2-11-2022
LOCATION:	Wooster Rd W, Barberton, OH

520 S Main St, Suite 2531 Akron, Ohio 44311

PAVEMENT CORE DATA

520 S Main St, Suite 2531
Akron, Ohio 44311

PROJECT: Wooster Road Rehabilitation **PID:**

COUNTY: Portage **DATE**: 03-30-2022

LOCATION: Wooster Rd W, Barberton, OH

Boring ID	Surface Pavement Composition	Thickness (in)	Secondary Pavement Composition	Thickness (in)	Base Composition	Thickness (in)
B-001-0-22	Asphalt	4.5	Brick	8	Slag	4
B-002-0-22	Asphalt	11.5	-	-	Limestone	4
B-003-0-22	Asphalt	3.75	Brick	3.5	Slag	6
B-004-0-22	Asphalt	3.5	Brick	3.5	Slag & Sand	14
B-005-0-22	Asphalt	3	Brick	3.5	Slag	9
B-006-0-22	Asphalt	4	Brick	3.75	Slag	10
B-007-0-22	Asphalt	2.5	Brick	4	Slag	15
B-008-0-22	Asphalt	4	Brick	3.5	Slag	16.5
B-009-0-22	Asphalt	4	Brick	7.5	Slag & Sand	16
B-010-0-22	Asphalt	3.5	Brick	3.5	Slag	9
B-011-0-22	Asphalt	4.25	Brick	4	Slag	9.75
B-012-0-22	Asphalt	4.5	Brick	3.5	Slag	6
B-013-0-22	Asphalt	8	-	-	Limestone & Slag	8.5
B-014-0-22	Asphalt	5	Brick	3.5	Slag	5.5
B-015-0-22	Asphalt	5	-	-	Limestone	7
B-016-0-22	Asphalt	5.5	-	-	Limestone	6
B-017-0-22	Asphalt	5.5	-	-	N/A	N/A
B-018-0-22	Asphalt	7	-	-	Limestone	6

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 302+82, 4' LT.	EXPLORATION ID B-001-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 980.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/8/22 END: 2/8/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.006903, -81.633884	

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
	980.0																		
4.5" ASPHALT	979.7																		
8" BRICK	979.0																		
4" GRANULAR BASE - SLAG	978.7																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, TRACE CLAY, DAMP		1 2 3 4	9 4 7 10 9 7 10	17 24	56 92	SS-1 SS-2	- -	- 42	- 26	- 14	- 14	- 4	- NP	- NP	- NP	6 8	A-1-b (V) A-1-b (0)	- 280	
	975.0	5																	
MEDIUM DENSE, BROWN AND GRAY, **GRAVEL WITH SAND AND SILT**	973.0	6 EOB 7	6 7 8 3	23	100	SS-3	-	33	20	17	24	6	NP	NP	NP	8	A-2-4 (0)	280	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 307+63, 6' RT.
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 993.0 (MSL) EOB: 7.0 ft.
START: 2/8/22 END: 2/8/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.007486, -81.632321

EXPLORATION ID B-002-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 993.0	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
11.5" ASPHALT	992.0																		
4" GRANULAR BASE	991.8																		
MEDIUM DENSE, BROWN, **SILT**, DAMP LITTLE CLAY AND SAND		1	8 6 2 1	12	71	SS-1	-	-	-	-	-	-	-	-	-	8	A-4b (V)	300	
VERY LOOSE, BROWN AND GRAY, **SILT**, MOIST TRACE GRAVEL AND CLAY	988.0	2 3 4	1 1 1 1	3	67	SS-2	-	7	1	8	77	7	23	16	7	26	A-4b (8)	300	
MEDIUM STIFF, GRAY, **SILT AND CLAY**, MOIST	986.0	5 6	1 2 1 1	5	100	SS-3	-	0	0	1	75	24	27	16	11	25	A-6a (8)	-	
		EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 311+98, 16' LT.	EXPLORATION ID B-003-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 1003.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.008081, -81.630955	

MATERIAL DESCRIPTION AND NOTES	ELEV. 1003.0	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
3.75" ASPHALT	1002.7																		
3.5" BRICK	1002.4																		
6" Slag (Base)	1002.0																		
LOOSE, BROWN, **GRAVEL WITH SAND** TRACE SILT, DAMP		1	3 2 3	8	67	SS-1	-	19	49	23	9	0	NP	NP	NP	7	A-1-b (0)	<100	
		2																	
		3	1 2 1 1	5	58	SS-2	-	34	41	16	9	0	NP	NP	NP	9	A-1-b (0)	<100	
		4																	
		5	2 1 2 2	5	71	SS-3	-	-	-	-	-	-	-	-	-	13	A-1-b (V)	-	
		6																	
	EOB	7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 315+37, 13' RT.	EXPLORATION ID B-004-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 994.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.008428, -81.629808	

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
3.5" ASPHALT	994.0																		
3.5" BRICK	993.7																		
14" GRANULAR BASE - SLAG AND SAND	993.4																		
NO RECOVERY; GRAB SAMPLE INDICATED SLAG (BASE)	992.3		50/2"	-	0	SS-1	-	-	-	-	-	-	-	-	-	-		-	
LOOSE, BROWN, **GRAVEL WITH SAND AND SILT**, (FILL) TRACE BRICK FRAGMENTS, DAMP	991.0		3 2 2 2	6	67	SS-2	-	28	20	23	27	2	21	15	6	10	A-2-4 (0)	<100	
MEDIUM DENSE, BROWN, **GRAVEL** SOME SAND, LITTLE SILT, DAMP	989.0		5 3 4 3	11	79	SS-3	-	51	24	11	12	2	NP	NP	NP	7	A-1-a (0)	<100	
	987.0	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 318+96, 13' LT.	EXPLORATION ID B-005-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 984.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.008943, -81.628697	

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
	984.0																		
3" ASPHALT	983.7																		
3.5" BRICK	983.4																		
9" GRANULAR BASE - SLAG	982.5																		
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND**, (FILL) SOME SILT, LITTLE GRAVEL, TRACE SLAG, DAMP		1	9 1 13 12	21	75	SS-1	-	18	19	33	30	0	18	15	3	11	A-3a (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND**, (FILL) SOME SILT AND GRAVEL, DAMP		2 3 4	1 1 2 3	5	63	SS-2	-	26	16	34	23	1	17	13	4	15	A-3a (0)	<100	
VERY LOOSE, BROWN, **COARSE AND FINE SAND** WET		5 6	2 1 1 2	3	88	SS-3	-	-	-	-	-	-	-	-	-	24	A-3a (V)	-	
	977.0	EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 323+31, 4' LT.	EXPLORATION ID B-006-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 982.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.009463, -81.627277	

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
	982.0																		
4" ASPHALT	981.7																		
3.75" BRICK	981.4																		
10" GRANULAR BASE - SLAG	980.5																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, (FILL) DAMP	979.0	1	10 11 7	27	17	SS-1	-	-	-	-	-	-	-	-	-	14	A-1-b (V)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND** LITTLE SILT, TRACE GRAVEL, DAMP		2 3 4	2 3 2 4	8	92	SS-2	-	9	5	66	18	2	NP	NP	NP	7	A-3a (0)	<100	
MEDIUM DENSE, BROWN, **COARSE AND FINE SAND** LITTLE SILT, MOIST	975.0	5 6 EOB 7	3 4 3 2	11	100	SS-3	-	0	0	87	11	2	NP	NP	NP	22	A-3a (0)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

PROJECT: WOOSTER RD W REHAB
TYPE: ROADWAY
PID: 108240 SFN:
START: 2/9/22 END: 2/9/22

DRILLING FIRM / OPERATOR: GPD / R. TOSATTO
SAMPLING FIRM / LOGGER: GPD / N. BURGESS
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: GP 7822 ATV
HAMMER: GEOPROBE AUTO
CALIBRATION DATE: 8/26/20
ENERGY RATIO (%): 90*

STATION / OFFSET: 326+76, 16' RT.
ALIGNMENT: WOOSTER RD W
ELEVATION: 980.0 (MSL) EOB: 7.0 ft.
LAT / LONG: 41.009844, -81.626128

EXPLORATION ID B-007-0-22

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
2.5" ASPHALT	980.0																		
4" BRICK	979.8																		
15" GRANULAR BASE - SLAG	979.5																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, (FILL) LITTLE SLAG AND SILT, DAMP	978.3		7 8 5	20	67	SS-1	-	47	18	19	13	3	NP	NP	NP	9	A-1-b (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND** SOME SILT, TRACE GRAVEL, DAMP	977.0		4 4 2 2	9	88	SS-2	-	5	22	47	25	1	NP	NP	NP	11	A-3a (0)	<100	
@ 5' VERY LOOSE			2 1 1 1	3	83	SS-3	-	-	-	-	-	-	-	-	-	8	A-3a (V)	-	
	973.0	EOB																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

PROJECT: WOOSTER RD W REHAB
TYPE: ROADWAY
PID: 108240 SFN:
START: 2/9/22 END: 2/9/22

DRILLING FIRM / OPERATOR: GPD / R. TOSATTO
SAMPLING FIRM / LOGGER: GPD / N. BURGESS
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: GP 7822 ATV
HAMMER: GEOPROBE AUTO
CALIBRATION DATE: 8/26/20
ENERGY RATIO (%): 90*

STATION / OFFSET: 331+70, 16' RT.
ALIGNMENT: WOOSTER RD W
ELEVATION: 977.0 (MSL) EOB: 7.0 ft.
LAT / LONG: 41.010410, -81.624518

EXPLORATION ID B-008-0-22

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
4" ASPHALT	977.0																		
3.5" BRICK	976.7																		
16.5" GRANULAR BASE - SLAG	976.4																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND**, (FILL) LITTLE SLAG AND SILT, DAMP	975.6		8 8 9	26	67	SS-1	- -	- 31	- 20	- 35	- 14	- 0	- NP	- NP	- NP	- 6	A-1-b (0)	- <100	
LOOSE, BROWN, **FINE SAND** TRACE SILT AND GRAVEL, DAMP	974.0		3 2 2 2	6	75	SS-2	-	9	13	68	9	1	NP	NP	NP	7	A-3 (0)	<100	
LOOSE, BROWN, **FINE SAND** LITTLE GRAVEL, DAMP	970.0	EOB	4 3 2 3	8	100	SS-3	-	-	-	-	-	-	-	-	-	12	A-3 (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 336+05, 16' RT.	EXPLORATION ID B-009-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 968.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/10/22 END: 2/10/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.010738, -81.623004	

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
	968.0																		
4" ASPHALT	967.7																		
7.5" BRICK	967.4																		
16" GRANULAR BASE - SLAG	965.8																		
VERY DENSE, BLACK AND BROWN, **GRAVEL**, (FILL) LITTLE SLAG AND SAND, TRACE SILT, DAMP	965.0	1	4 50 13 9	95	75	SS-1	-	62	17	12	8	1	NP	NP	NP	10	A-1-a (0)	<100	
LOOSE, BROWN, **SANDY SILT** DAMP		2 3 4	6 3 2 2	8	100	SS-2	-	-	-	-	-	-	-	-	-	21	A-4a (V)	<100	
VERY LOOSE, BROWN, **SANDY SILT** LITTLE CLAY, DAMP	961.0	5 6 7 EOB	WOH WOH 1 3	2	100	SS-3	-	5	9	35	41	10	22	14	8	19	A-4a (3)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 340+27, 18' LT.	EXPLORATION ID B-010-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 965.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.011142, -81.621564	

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
965.0																			
3.5" ASPHALT	964.7																		
3.5" BRICK	964.4																		
9" GRANULAR BASE - SLAG	963.7																		
VERY LOOSE, BROWN, **COARSE AND FINE SAND**, (FILL) SOME SILT, TRACE GRAVEL, TRACE CLAY, DAMP		1	2 1 1	3	89	SS-1	-	13	20	37	28	2	NP	NP	NP	14	A-3a (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND** LITTLE SILT, TRACE GRAVEL, DAMP		2 3 4	3 2 3 2	8	71	SS-2	-	1	4	83	12	0	NP	NP	NP	7	A-3a (0)	<100	
LOOSE, BROWN, **COARSE AND FINE SAND** MOIST		5 6	3 3 2 2	8	83	SS-3	-	-	-	-	-	-	-	-	-	17	A-3a (V)	-	
	958.0	EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 343+45, 17' LT.	EXPLORATION ID B-011-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 964.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.011346, -81.620441	

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
	964.0																		
4.25" ASPHALT	963.7																		
4" BRICK	963.3																		
9.75" GRANULAR BASE - SLAG	962.5																		
MEDIUM DENSE, DARK GRAY, **GRAVEL WITH SAND**, (FILL) LITTLE SLAG AND SILT, DAMP		1	9 9 3 2	18	67	SS-1	-	36	24	22	17	1	NP	NP	NP	14	A-1-b (0)	340	
VERY LOOSE, DARK GRAY AND BROWN, **GRAVEL WITH SAND**, (FILL) LITTLE ORGANICS AND SILT, DAMP		2 3 4	6 1 1 1	3	92	SS-2	-	33	24	24	17	2	NP	NP	NP	24	A-1-b (0)	340	
VERY LOOSE, DARK GRAY, **GRAVEL WITH SAND**, (FILL) LITTLE PEAT FIBERS AND ORGANICS, MOIST	957.0	5 6 EOB 7	WOH WOH 1 1	2	100	SS-3	-	-	-	-	-	-	-	-	-	64	A-1-b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 347+76, 17' RT.	EXPLORATION ID B-012-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 964.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/8/22 END: 2/8/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.011598, -81.618912	

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
4.5" ASPHALT	964.0																		
3.5" BRICK	963.6																		
6" GRANULAR BASE - SLAG	963.3																		
MEDIUM DENSE, RED, **UNCONTROLLED FILL**, (FILL) SAND AND SLAG, MOIST TO WET	962.9	1	14 7 2 2	14	8	SS-1	-	-	-	-	-	-	-	-	-	16	UCF (V)	<100	
LOOSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, WET	961.0	2 3 4	1 1 2 1	5	33	SS-2	-	36	18	34	11	1	NP	NP	NP	16	A-1-b (0)	<100	
VERY LOOSE, BROWN, **COARSE AND FINE SAND** LITTLE SILT AND GRAVEL, WET	959.0	5	WOH WOH WOH WOH	0	25	SS-3	-	13	16	57	13	1	NP	NP	NP	19	A-3a (0)	-	
	957.0 EOB	6 7																	

NOTES: ZONE 3' TO 5' APPEARED TO HAVE BEEN LIME STABILIZED

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGSBACKFILLED WITH

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 351+84, 16' LT.
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 967.0 (MSL) EOB: 7.0 ft.
START: 2/10/22 END: 2/10/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.012005, -81.617530

EXPLORATION ID B-013-0-22

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 967.0	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" ASPHALT	966.3																		
8.5" GRANULAR BASE	965.6																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, DAMP		1–2	16 10 6 3	24	75	SS-1	-	49	20	17	13	1	NP	NP	NP	7	A-1-b (0)	<100	
LOOSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, MOIST		3–4	2 2 1 1	5	92	SS-2	-	18	41	28	10	3	NP	NP	NP	8	A-1-b (0)	<100	
	960.0	5–6	5 4 2 1	9	92	SS-3	-	-	-	-	-	-	-	-	-	11	A-1-b (V)	-	
		EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 355+18, 17' RT.	EXPLORATION ID B-014-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 974.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/10/22 END: 2/10/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.012122, -81.616333	

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
	974.0																		
5" ASPHALT	973.6																		
3.5" BRICK	973.3																		
5.5" Slag (Base)	972.9																		
DENSE, RED AND BLACK, **UNCONTROLLED FILL**, (FILL) BRICK FRAGMENTS AND CINDERS, DAMP	971.0	1	31 30 7 4	56	100	SS-1	-	-	-	-	-	-	-	-	-	12	UCF (V)	<100	
VERY LOOSE, BROWN, **FINE SAND** TRACE SILT & GRAVEL, DAMP		2 3 4 5	1 1 1 1	3	79	SS-2	-	5	16	71	8	0	NP	NP	NP	9	A-3 (0)	<100	
LOOSE, TAN, WITH SANDSTONE FRAGMENTS	967.0	6	2 2 2 1	6	25	SS-3	-	-	-	-	-	-	-	-	-	-	A-3 (V)	-	
		EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 359+95, 14' LT.	EXPLORATION ID B-015-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 976.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/9/22 END: 2/9/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.012169, -81.614602	

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" ASPHALT	976.0																		
7" GRANULAR BASE	975.6																		
VERY LOOSE, BROWN, **SANDY SILT** LITTLE GRAVEL, TRACE CLAY AND SLAG, MOIST TO DAMP	975.0	1	3 2 1 1	5	63	SS-1	-	23	16	24	30	7	23	15	8	14	A-4a (0)	<100	
	973.0	2																	
LOOSE, BROWN, **GRAVEL WITH SAND** TRACE SILT AND CLAY, MOIST		3	4 2 3 3	8	79	SS-2	-	30	28	25	8	9	NP	NP	NP	13	A-1-b (0)	<100	
@5.0'; VERY LOOSE		4																	
		5	2 1 1 2	3	58	SS-3	-	-	-	-	-	-	-	-	-	8	A-1-b (V)	-	
	969.0	6																	
	EOB	7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 364+16, 3' RT.	EXPLORATION ID B-016-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 976.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/10/22 END: 2/10/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.012104, -81.613082	

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
	976.0																		
5.5" ASPHALT	975.5																		
6" GRANULAR BASE	975.0																		
MEDIUM DENSE, BROWN AND GRAY, **GRANULAR BASE** SAND, LIMESTONE GRAVEL, AND SLAG, MOIST TO WET	973.0	1	5 6 4 3	15	38	SS-1	-	-	-	-	-	-	-	-	-	18	UCF (V)	280	
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, TRACE CLAY, DAMP		2																	
@5.0'; LOOSE		3	4 3 4 3	11	75	SS-2	-	37	27	19	11	6	NP	NP	NP	11	A-1-b (0)	280	
		4																	
		5																	
		6	2 2 2	6	75	SS-3	-	32	36	20	10	2	NP	NP	NP	10	A-1-b (0)	-	
	969.0	EOB 7																	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

STANDARD ODOT LOG W/ SULFATES (8.5 X 11) - OH DOT.GDT - 8/29/23 09:06 - F:\GPD GILCHRIST\JOBS\2022\GPD\DRILLING\2021177.02 - BARBERTON WEST WOOSTER ROAD IMPROVEMENT

PROJECT: WOOSTER RD W REHAB	DRILLING FIRM / OPERATOR: GPD / R. TOSATTO	DRILL RIG: GP 7822 ATV	STATION / OFFSET: 368+84, 15' LT.	EXPLORATION ID B-017-0-22
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: GPD / N. BURGESS	HAMMER: GEOPROBE AUTO	ALIGNMENT: WOOSTER RD W	
PID: 108240 SFN:	DRILLING METHOD: 2.25" HSA	CALIBRATION DATE: 8/26/20	ELEVATION: 965.0 (MSL) EOB: 7.0 ft.	PAGE 1 OF 1
START: 2/10/22 END: 2/10/22	SAMPLING METHOD: SPT	ENERGY RATIO (%): 90*	LAT / LONG: 41.012109, -81.611383	

MATERIAL DESCRIPTION AND NOTES	ELEV. 965.0	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
5.0" ASPHALT	964.5																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND AND SILT** DAMP	962.0	1 2 3	2 3 5 5	12	71	SS-1	-	32	29	17	20	2	22	14	8	12	A-2-4 (0)	<100	
LOOSE, BROWN, **GRAVEL WITH SAND** TRACE SILT AND CLAY, MOIST	958.0	4 5 6 EOB 7	2 2 3 2	8	75	SS-2	-	37	26	24	8	5	NP	NP	NP	14	A-1-b (0)	<100	
			2 2 1 1	5	67	SS-3	-	-	-	-	-	-	-	-	-	12	A-1-b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

PROJECT: WOOSTER RD W REHAB
TYPE: ROADWAY
PID: 108240 SFN:
START: 2/10/22 END: 2/10/22

DRILLING FIRM / OPERATOR: GPD / R. TOSATTO
SAMPLING FIRM / LOGGER: GPD / N. BURGESS
DRILLING METHOD: 2.25" HSA
SAMPLING METHOD: SPT

DRILL RIG: GP 7822 ATV
HAMMER: GEOPROBE AUTO
CALIBRATION DATE: 8/26/20
ENERGY RATIO (%): 90*

STATION / OFFSET: 372+11, 17' RT.
ALIGNMENT: WOOSTER RD W
ELEVATION: 977.0 (MSL) EOB: 7.0 ft.
LAT / LONG: 41.011987, -81.610204

EXPLORATION ID B-018-0-22

MATERIAL DESCRIPTION AND NOTES	ELEV. 977.0	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
7" ASPHALT	976.4																		
6" GRANULAR BASE	975.9																		
MEDIUM DENSE, BROWN, **GRAVEL WITH SAND** LITTLE SILT, DAMP		1	WOH 4 3 4	11	63	SS-1	-	33	27	21	13	6	NP	NP	NP	11	A-1-b (0)	<100	
@ 3' TRACE SILT, MOIST		2 3 4	2 7 2 3	14	67	SS-2	-	39	34	18	8	1	NP	NP	NP	7	A-1-b (0)	<100	
@5.0'; LOOSE	970.0	5 6 EOB 7	5 2 3 5	8	100	SS-3	-	-	-	-	-	-	-	-	-	6	A-1-b (V)	-	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: POURED QUICKCRETE; BACKFILLED WITH SOIL CUTTINGS

OHIO DEPARTMENT OF TRANSPORTATION

OFFICE OF GEOTECHNICAL ENGINEERING

PLAN SUBGRADES
Geotechnical Design Manual Section 600

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

GE-WOOSTER RD W-SECTIONS 76, 77

<108240>

<PROJECT DESCRIPTION - Rehabilitation of Wooster Rd W through Barberton, approximately 8,000 feet of roadway>

<GPD Group>

Prepared By: <Amanda Idri>
Date prepared: <04/07/2022>

<Delbert Channels>
<520 S Main St>
<Suite 2531>
<Akron, OH 44311>
<330-572-3671>
<dchannels@gpdgroup.com>

NO. OF BORINGS: 18

#	Boring ID	Alignment	Station	Offset	Dir	Drill Rig	ER	Boring EL.	Proposed Subgrade EL	Cut Fill
1	B-001-0-22	CL Wooster Rd W	302+82	4	LT	GP 7822 ATV	90	980.0	978.8	1.2 C
2	B-002-0-22	CL Wooster Rd W	307+63	6	RT	GP 7822 ATV	90	993.0	991.9	1.1 C
3	B-003-0-22	CL Wooster Rd W	311+98	16	LT	GP 7822 ATV	90	1003.0	1002.2	0.8 C
4	B-004-0-22	CL Wooster Rd W	315+37	13	RT	GP 7822 ATV	90	994.0	993.2	0.8 C
5	B-005-0-22	CL Wooster Rd W	318+96	13	LT	GP 7822 ATV	90	984.0	983.2	0.8 C
6	B-006-0-22	CL Wooster Rd W	323+31	4	LT	GP 7822 ATV	90	982.0	981.3	0.7 C
7	B-007-0-22	CL Wooster Rd W	326+76	16	RT	GP 7822 ATV	90	980.0	979.3	0.7 C
8	B-008-0-22	CL Wooster Rd W	331+70	16	RT	GP 7822 ATV	90	977.0	976.2	0.9 C
9	B-009-0-22	CL Wooster Rd W	336+05	16	RT	GP 7822 ATV	90	968.0	967.0	1.0 C
10	B-010-0-22	CL Wooster Rd W	340+27	18	LT	GP 7822 ATV	90	965.0	964.0	1.0 C
11	B-011-0-22	CL Wooster Rd W	343+45	17	LT	GP 7822 ATV	90	964.0	962.5	1.5 C
12	B-012-0-22	CL Wooster Rd W	347+76	17	RT	GP 7822 ATV	90	964.0	962.8	1.2 C
13	B-013-0-22	CL Wooster Rd W	351+84	16	LT	GP 7822 ATV	90	967.0	965.9	1.1 C
14	B-014-0-22	CL Wooster Rd W	355+18	17	RT	GP 7822 ATV	90	965.0	964.1	0.9 C
15	B-015-0-22	CL Wooster Rd W	359+95	14	LT	GP 7822 ATV	90	976.0	975.2	0.8 C
16	B-016-0-22	CL Wooster Rd W	364+16	3	RT	GP 7822 ATV	90	976.0	975.2	0.8 C
17	B-017-0-22	CL Wooster Rd W	368+84	15	LT	GP 7822 ATV	90	975.0	974.3	0.7 C
18	B-018-0-22	CL Wooster Rd W	372+11	17	RT	GP 7822 ATV	90	977.0	975.7	1.3 C

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
1	B	1	1.0	2.5	-0.2	1.3	17									6	6	A-1-b	0						
	001-0	2	3.0	5.0	1.8	3.8	24			np	np	NP	14	4	18	8	6	A-1-b	0	280					
	22	3	5.0	7.0	3.8	5.8	23			np	np	NP	24	6	30		10	A-2-4	0	280					
				7.0				17																	
2	B	1	1.0	2.5	-0.1	1.4	12									8	10	A-4b	8	300	A-4b		36"		
	002-0	2	3.0	5.0	1.9	3.9	3			23	16	7	77	7	84	26	11	A-4b	8	300					
	22	3	5.0	7.0	3.9	5.9	5			27	16	11	75	24	99	25	14	A-6a	8						
								3																	
3	B	1	1.0	2.5	0.2	1.7	8			np	np	NP	9	0	9	7	6	A-1-b	0	100					
	003-0	2	3.0	5.0	2.2	4.2	5			np	np	NP	9	0	9	9	6	A-1-b	0	100					
	22	3	5.0	7.0	4.2	6.2	5									13	6	A-1-b	0						
								5																	
4	B	1	1.0	2.5	0.2	1.7											10	A-4a	8			N_{60}		0"	
	004-0	2	3.0	5.0	2.2	4.2	6			21	15	6	27	2	29	10	10	A-2-4	0	100					
	22	3	5.0	7.0	4.2	6.2	11			np	np	NP	12	2	14	7	6	A-1-a	0	100					
								6																	
5	B	1	1.0	3.0	0.2	2.2	21			18	15	3	30	0	30	11	8	A-3a	0	100					
	005-0	2	3.0	5.0	2.2	4.2	5			17	13	4	23	1	24	15	8	A-3a	0	100					
	22	3	5.0	7.0	4.2	6.2	3									24	8	A-3a	0						
								3																	
6	B	1	1.0	2.5	0.3	1.8	27									14	6	A-1-b	0	100					
	006-0	2	3.0	5.0	2.3	4.3	8			np	np	NP	18	2	20	7	8	A-3a	0	100					
	22	3	5.0	7.0	4.3	6.3	11			np	np	NP	11	2	13	22	8	A-3a	0						
								8																	
7	B	1	1.0	2.5	0.3	1.8	20			np	np	NP	13	3	16	9	6	A-1-b	0	100					
	007-0	2	3.0	5.0	2.3	4.3	9			np	pnp	NP	25	1	26	11	8	A-3a	0	100					
	22	3	5.0	7.0	4.3	6.3	3									8	8	A-3a	0						
								3																	
8	B	1	1.0	2.5	0.1	1.7	26			np	np	NP	14	0	14	6	6	A-1-b	0	100					
	008-0	2	3.0	5.0	2.2	4.2	6			np	np	NP	9	1	10	7	8	A-3	0	100					
	22	3	5.0	7.0	4.2	6.2	8									12	8	A-3	0						
								6																	
9	B	1	1.0	3.0	0.0	2.0	95			np	np	NP	8	1	9	10	6	A-1-a	0	100					
	009-0	2	3.0	5.0	2.0	4.0	8									21	10	A-4a	8	100					
	22	3	5.0	7.0	4.0	6.0	3			22	14	8	41	10	51	19	10	A-4a	3						

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
								3																	
10	B	1	1.0	2.5	0.0	1.5	3			np	np	NP	28	2	30	14	8	A-3a	0	100					
	010-0	2	3.0	5.0	2.0	4.0	8			np	np	NP	12	3	15	7	8	A-3a	0	100					
	22	3	5.0	7.0	4.0	6.0	8									17	8	A-3a	0						
								3																	
11	B	1	1.0	3.0	-0.5	1.5	18			np	np	NP	17	1	18	14	6	A-1-b	0	340					
	011-0	2	3.0	5.0	1.5	3.5	3			np	np	NP	17	2	19	24	6	A-1-b	0	340					
	22	3	5.0	7.0	3.5	5.5	2									64	6	A-1-b	0						
								2																	
12	B	1	1.0	3.0	-0.2	1.8	14									16	10	A-4b	8	100	A-4b	N_{60} & Mc	**36"**	**12"**	
	012-0	2	3.0	5.0	1.8	3.8	5			np	np	NP	11	1	12	16	6	A-1-b	0	100					Material described as A-4b here is UCF.
	22	3	5.0	7.0	3.8	5.8	0			np	np	NP	13	1	14	19	8	A-3a	0						
								0																	
13	B	1	1.0	3.0	-0.1	1.9	24			np	np	NP	13	1	14	7	6	A-1-b	0	100					
	013-0	2	3.0	5.0	1.9	3.9	5			np	np	NP	10	3	13	8	6	A-1-b	0	100					
	22	3	5.0	7.0	3.9	5.9	9									11	6	A-1-b	0						
								5																	
14	B	1	1.0	3.0	0.1	2.1	56									12	10	A-4b	8	100	A-4b		**36"**		
	014-0	2	3.0	5.0	2.1	4.1	3			np	np	NP	8	0	8	9	8	A-3	0	100					Material described as A-4b here is UCF.
	22	3	5.0	7.0	4.1	6.1	6										8	A-3	0						
								3																	
15	B	1	1.0	3.0	0.2	2.2	5			23	15	8	30	7	37	14	10	A-4a	0	100		N_{60} & Mc		**21"**	
	015-0	2	3.0	5.0	2.2	4.2	8			np	np	NP	8	9	17	13	6	A-1-b	0	100					
	22	3	5.0	7.0	4.2	6.2	3									4	6	A-1-b	0						
								3																	
16	B	1	1.0	3.0	0.2	2.2	15									18	10	A-4b	8	280	A-4b	Mc	**36"**		
	016-0	2	3.0	5.0	2.2	4.2	11			np	np	NP	11	6	17	11	6	A-1-b	0	280					Material described as A-4b here is UCF.
	22	3	5.0	7.0	4.2	6.2	6			np	np	NP	10	2	12	10	6	A-1-b	0						
								6																	
17	B	1	1.0	3.0	0.3	2.3	12			22	14	8	20	2	22	12	10	A-2-4	0	100					
	017-0	2	3.0	5.0	2.3	4.3	8			np	np	NP	8	5	13	14	6	A-1-b	0	100					
	22	3	5.0	7.0	4.3	6.3	5									12	6	A-1-b	0						
								5																	
18	B	1	1.0	3.0	-0.3	1.7	11			np	np	NP	13	6	19	11	6	A-1-b	0	100					
	018-0	2	3.0	5.0	1.7	3.7	14			np	np	NP	8	1	9	7	6	A-1-b	0	100					

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

#	Boring	Sample	Sample Depth		Subgrade Depth		Standard Penetration		HP (tsf)	Physical Characteristics						Moisture		Ohio DOT		Sulfate Content (ppm)	Problem		Excavate and Replace (Item 204)		Recommendation (Enter depth in inches)
			From	To	From	To	N_{60}	N_{60L}		LL	PL	PI	% Silt	% Clay	P200	M_C	M_{OPT}	Class	GI		Unsuitable	Unstable	Unsuitable	Unstable	
	22	3	5.0	7.0	3.7	5.7	8									6	6	A-1-b	0						
								8																	

OHIO DEPARTMENT OF TRANSPORTATION

Subgrade Analysis

V. 14.6 2/11/2022

PID: <108240>

County-Route-Section: <PORTAGE-WOOSTER RD W-SECTIONS 76, 77, 67, 68>
No. of Borings: 18

Geotechnical Consultant: <GPD Group>
Prepared By: <Amanda Idri>
Date prepared: <04/07/2022>

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):	21''
Average(HP):	0''
Global Geogrid Average(N60L):	15''
Average(HP):	0''

Design CBR	11

% Samples within 6 feet of subgrade			
$N_{60} \leq 5$	33%	HP ≤ 0.5	0%
$N_{60} < 12$	69%	0.5 < HP ≤ 1	0%
$12 \leq N_{60} < 15$	7%	1 < HP ≤ 2	0%
$N_{60} \geq 20$	17%	HP > 2	0%
M+	6%		
Rock	0%		
Unsuitable	9%		

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

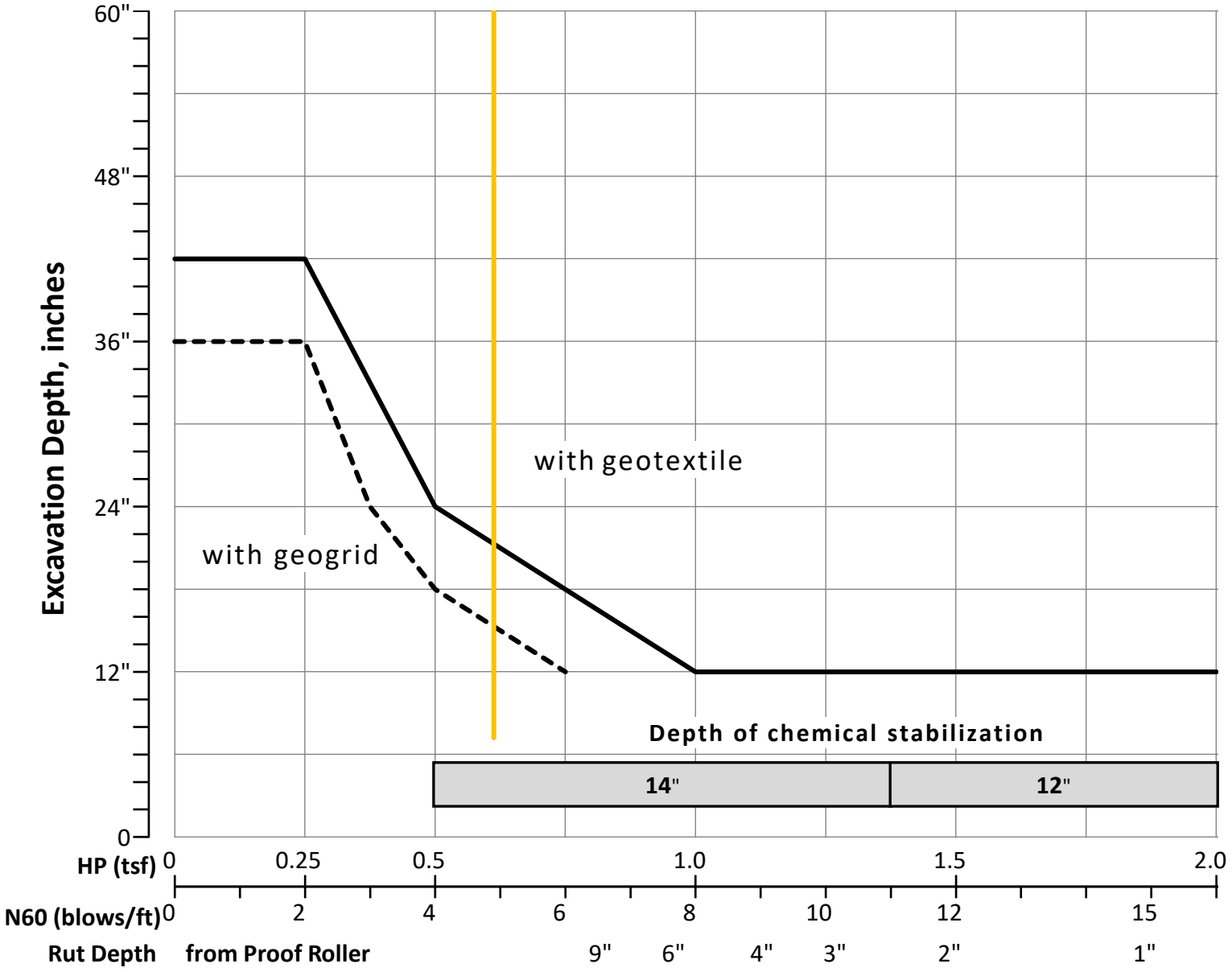
% Proposed Subgrade Surface	
Unstable & Unsuitable	22%
Unstable	11%
Unsuitable	11%

	N_{60}	N_{60L}	HP	LL	PL	PI	Silt	Clay	P 200	M_C	M_{OPT}	GI
Average	12	5	NP	22	15	7	19	3	23	13	8	1
Maximum	95	17	NP	27	16	11	77	24	99	64	14	8
Minimum	0	0	NP	17	13	3	8	0	8	4	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	2	24	3	0	0	0	4	11	4	5	0	1	0	0	0	0	0	54
Percent	0%	4%	44%	6%	0%	0%	0%	7%	20%	7%	9%	0%	2%	0%	0%	0%	0%	0%	100%
% Rock|Granular|Cohesive	0%	89%									11%								100%
Surface Class Count	0	1	17	2	0	0	0	2	6	3	5	0	0	0	0	0	0	0	36
Surface Class Percent	0%	3%	47%	6%	0%	0%	0%	6%	17%	8%	14%	0%	0%	0%	0%	0%	0%	0%	100%

Fig. 600-1 – Subgrade Stabilization



OVERRIDE TABLE

Calculated Average	New Values	Check to Override
NP	0.50	☐ HP
4.94	6.00	☐ N60L

Average HP
Average N_{60L}

APPENDIX A.1 - ODOT Quick Reference for Visual Description of Soils

1) STRENGTH OF SOIL:

Non-Cohesive (granular) Soils - Compactness	
Description	**Blows Per Ft.**
Very Loose	≤ 4
Loose	5 – 10
Medium Dense	11 – 30
Dense	31 – 50
Very Dense	> 50

2) COLOR :

If a color is a uniform color throughout, the term is single, modified by an adjective such as light or dark. If the predominate color is shaded by a secondary color, the secondary color procedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled"

3) PRIMARY COMPONENT

Use **DESCRIPTION** from ODOT Soil Classification Chart on Back

Cohesive (fine grained) Soils - Consistency

Description	Qu (TSF)	Blows Per Ft.	Hand Manipulation
Very Soft	<0.25	<2	Easily penetrates 2" by fist
Soft	0.25-0.5	2 - 4	Easily penetrates 2" by thumb
Medium Stiff	0.5-1.0	5 - 8	Penetrates by thumb with moderate effort
Stiff	1.0-2.0	9 - 15	Readily indents by thumb, but not penetrate
Very Stiff	2.0-4.0	16 - 30	Readily indents by thumbnail
Hard	>4.0	>30	Indent with difficulty by thumbnail

4) COMPONENT MODIFIERS:

Description	Percentage By Weight
Trace	0% - 10%
Little	10% - 20%
Some	20% - 35%
"And"	35% -50%

5) Soil Organic Content

Description	% by Weight
Slightly Organic	2% - 4%
Moderately Organic	4% - 10%
Highly Organic	> 10%

6) Relative Visual Moisture

Description	Criteria	
	Cohesive Soil	**Non-cohesive Soils**
Dry	Powdery; Cannot be rolled; Water content well below the plastic limit	No moisture present
Damp	Leaves very little moisture when pressed between fingers; Crumbles at or before rolled to $^1/_8$"; Water content below plastic limit	Internal moisture, but no to little surface moisture
Moist	Leaves small amounts of moisture when pressed between fingers; Rolled to $^1/_8$" or smaller before crumbling; Water content above plastic limit to -3% of the liquid limit	Free water on surface, moist (shiny) appearance
Wet	Very mushy; Rolled multiple times to $^1/_8$" or smaller before crumbles; Near or above the liquid limit	Voids filled with free water, can be poured from split spoon.

CLASSIFICATION OF SOILS

Ohio Department of Transportation

(The classification of a soil is found by proceeding from top to bottom of the chart.
The first classification that the test data fits is the correct classification.)

SYMBOL	DESCRIPTION	Classifcation AASHTO	Classifcation OHIO	LL_0/LL x 100*	% Pass #40	% Pass #200	Liquid Limit (LL)	Plastic Index (PI)	Group Index Max.	REMARKS
	Gravel and/or Stone Fragments	A-1-a			30 Max.	15 Max.		6 Max.	0	Min. of 50% combined gravel, cobble and boulder sizes
	Gravel and/or Stone Fragments with Sand	A-1-b			50 Max.	25 Max.		6 Max.	0	
F.S.	Fine Sand	A-3			51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	--	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4				35 Max.	40 Max.	10 Max.	0	
		A-2-5					41 Min.			
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6				35 Max.	40 Max.	11 Min.	4	
		A-2-7					41 Min.			
	Sandy Silt	A-4	A-4a	76 Min.		36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b	76 Min.		50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay	A-5		76 Min.		36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a	76 Min.		36 Min.	40 Max.	11 - 15	10	
	Silty Clay	A-6	A-6b	76 Min.		36 Min.	40 Max.	16 Min.	16	
	Elastic Clay	A-7-5		76 Min.		36 Min.	41 Min.	$\geq$LL-30	20	
	Clay	A-7-6		76 Min.		36 Min.	41 Min.	>LL-30	20	
	Organic Silt	A-8	A-8a	75 Max.		36 Min.				W/o organics would classify as A-4a or A-4b
	Organic Clay	A-8	A-8b	75 Max.		36 Min.				W/o organics would classify as A-5, A-6a, A-6b, A-7-5 or A-7-6

MATERIAL CLASSIFIED BY VISUAL INSPECTION

Sod and Topsoil

Pavement or Base

Uncontrolled Fill (Describe)

Bouldery Zone

Peat, S-Sedimentary W-Woody F-Fibrous L-Loamy & etc

* Only perform the oven-dried liquid limit test and this calculation if organic material is present in the sample.