ADDENDUM
NO. 4

August 25, 2021

SCHOOL CITY OF HAMMOND -
2021 RENOVATIONS TO MORTON HIGH SCHOOL AND SCOTT MIDDLE SCHOOL
Hammond, IN 46320

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications, and the Drawings dated July 26, 2021 by Schmidt Associates. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of page ADD 4-1.

A. SPECIFICATION SECTION 00 20 00 - INFORMATION AVAILABLE TO BIDDERS

1. **Add:**

   The attached soil boring report provided by Advanced Engineering Services.

B. SPECIFICATION SECTION 12 61 00 - FIXED AUDIENCE SEATING

1. **Delete:**

   From Alternate 1 and Alternate 2 - c. Davis Seating, Convention T35'Black.

SCHOOL CITY OF
HAMMOND

advanced engineering services

REPORT OF
GEOTECHNICAL ENGINEERING EXPLORATION
Improvements at Charles N. Scott Middle School

3635 173rd Street, Hammond, Indiana
AES Project No. 2021-1028G

Prepared For

Mr. Robert Moricz
Director of Building and Grounds
School City of Hammond
41 Williams Street
Hammond, Indiana 46320

April 5, 2021

aes
advanced engineering services

Advanced Engineering Services (AES) Inc.
7439 Calumet Avenue I Hammond, IN 46324
219.933.7888 I www.adv-engrs.com

April 5, 2021

Mr. Robert Moricz
Director of Building and Grounds
School City of Hammond
41 Williams Street
Hammond, Indiana 46320

Re: Report of Geotechnical Engineering Exploration
Proposed Improvements at Charles N. Scott Middle School
3635 173rd Street, Hammond, Indiana
AES Project No. 2021-1028G

Dear Mr. Moricz:

Advanced Engineering Services (AES) is pleased to submit herewith a report of a geotechnical exploration for the proposed improvements planned at the Charles N. Scott Middle School in Hammond, Indiana. This study was performed in accordance with AES Proposal No. 2021-149G dated March 22, 2021, which was authorized by you on March 23, 2021.

This report contains field and laboratory test results, an engineering interpretation of the data with respect to the available project characteristics and our geotechnical engineering recommendations to aid design and construction of the proposed improvements and other earth-related phases of this project.

AES appreciates the opportunity to be of service to you on this project. If we can be of any further assistance, or if you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,
Advanced Engineering Services (AES) Inc.

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1.0 INTRODUCTION

This report presents the results of a geotechnical engineering exploration for the proposed improvements at the Charles N. Scott Middle School in Hammond, Indiana. This study was performed in accordance with AES Proposal No. 2021-149G dated March 22, 2021.

1.1 Purpose and Scope

The purpose of the study was to: obtain subsurface soil and groundwater information present at the site based on test borings, evaluate the suitability of the encountered materials to support the proposed construction, provide geotechnical engineering recommendations based on the field and laboratory tests for the design of the proposed earth-related phases of the project.

The scope of this exploration includes: a limited site reconnaissance, field soil borings, field and laboratory testing and an engineering evaluation of the encountered subsurface conditions based on the soil borings.

Please note that our recommendations are prepared solely based on the results of the field test borings and in accordance with generally accepted geotechnical engineering principles and practices. It is important to understand that the subsurface soil conditions at other locations may be different and hence no warranties are expressed or implied in this report. We are not responsible for independent conclusions, opinions or recommendations made by others.

1.2 Site and Project Description

New improvements are planned at the Chales N. Scott Middle School in Hammond, Indiana. While no detailed information or drawings were available at the time of the study, we understand that the project will include installation of dry-wells to improve stormwater drainage for the facility. Furthermore, we were informed that the existing parking lots will be reconstructed. No building or other structures are considered for the project.

The project site is located generally within a residential setting. In the absence of any topographic survey, the existing ground surface appears to be relatively flat.

2.0 FIELD AND LABORATORY EXPLORATIONS

2.1 Field Exploration

As requested, the field exploration program consisted of eight (8) soil test borings at the approximate locations shown on the Boring Location Plan in the Appendix. Borings S-1, S-2 and S-3 were drilled in the landscaped areas to a depth of 15 ft and Borings P-1 through P-5 were completed in the parking lots to a depth of 5 ft below the existing grade.

The test boring locations were established in the field by AES representative by estimating distances from various site features, adjusting test locations due to existing utilities and based on the available drawings. Since these measurements are not precise, the boring locations shown on the attached Boring Location Plan should be considered approximate. Ground surface elevations reported on the boring logs were estimated from Google Earth®. Indiana-811 was notified to mark existing underground features in the public areas. In addition, we hired a private utility locator (GPRS) to clear the soil boring locations, as requested.

The soil borings were completed using an ATV-mounted drill-rig. Conventional hollow-stem augers were used to advance the boreholes through the soil. Standard Penetration Tests (SPT) were performed in accordance with applicable ASTM standards. Representative split-spoon samples were obtained at selected intervals. The SPT (N) value corresponding to each split-spoon sample provides general information about the strength and consistency of the naturally occurring materials. The Soil Classification Sheet provided in Appendix explains the SPT test procedure in brief. Groundwater observations were made during and immediately after completion of the drilling operations. SPT values and groundwater observations are noted on the respective Test Boring Logs.

Field short-term infiltration tests were performed near Borings S-1, S-2 and S-3 to a depth of about 4 ft below the existing ground surface. The tests were completed as per the procedure suggested by Indiana Office of Community and Rural Affairs (OCRA). A 2 inches diameter PVC piezometer (with no screen) was installed inside the boreholes. The annular space was backfilled with sand or auger cuttings. Water was then poured into the piezometer for initial saturation of the test holes. After completion of the initial saturation, water was added and time was monitored for a period of time and for a known volume of water to dissipate from the piezometer to determine the field percolation rates. The bore holes were backfilled using auger cuttings after completion of drilling.

2.2 Laboratory Explorations

Samples from the field were placed in sealed containers and brought to the laboratory for further analysis. The laboratory program included a supplementary visual classification on all samples and the field logs were edited accordingly. Moisture and organic contents, and grain size analysis tests were completed on selected samples and included on the respective logs or included in the appendix.

The Test Boring Logs in the Appendix describe visual classifications of all soil strata encountered using the Unified Soil Classification System (USCS). Soil classification explaining terms and symbols used on the logs is provided in the Appendix. Please note that we will store the samples for sixty days after which they will be discarded unless you request otherwise.

3.0 GENERAL SUBSURFACE CONDITIONS

3.1 General

The subsurface materials encountered and groundwater observations at each boring are described in detail on the Test Boring Logs provided in Appendix. It should be noted that stratification lines shown on the boring logs represent approximate transitions between material types. In-situ strata changes could occur gradually or at slightly different levels. Also, it should be noted that the boring logs depict conditions at the soil boring locations only and the subsurface conditions at other locations may vary. Some conditions, such as groundwater conditions, could change with time.

3.2 Subsurface Soil and Groundwater Profile

Parking lot Borings P-1 through P-5 encountered about 1 to 3 inches of asphalt underlain by about 4 to 14 inches of sand and gravel at the existing ground surface. From the existing ground surface of Borings S-1, S-2 and S-3 and below the pavement in Boring P-1, old fill materials consisting of dark brown to black sandy clay with variable organics were encountered, which extended to depths varying between about 1 ft and 3.5 ft below the existing surface grade. Moisture and organic contents of the fill materials were as high as about 52% and 9%, respectively.

All soil borings then revealed predominantly brown to gray poorly grade sand with silt (SP-SM) and silty sand (SM) to the termination depths of 5 ft in Borings P-1 through P-5 and 15 ft in Boring S-1, S-2 and S-3. Based on the field Standard Penetration Test (SPT) values, the natural sand was very loose to medium dense.

However, there were significant exceptions noted in Borings P-4 and S-1, where about 1 ft to 1.5 ft thick layer of dark brown to black sandy silt with organics were encountered at approximate depths of 3.5 ft and 8.5 ft, respectively, below the existing ground surface. Moisture and organic contents of the samples obtained from this layer were as high as about 66% to 13%, respectively.

3.3 Groundwater Profile

Groundwater observations were made during the drilling operations by noting the depth of water on the drilling tools and in the open boreholes following withdrawal of the drilling augers. Free groundwater was noted in all locations at depths ranging between about 3.5 and 4.5 ft below the existing grade.

While short-term groundwater observations in granular soils provide an accurate groundwater information at the time of drilling, groundwater conditions may change due to precipitation and other hydro-geologic factors.

4.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

4.1 General

Based upon our analysis of the soil conditions revealed by the test borings and the available project information, the following recommendations were developed. Please note that if the project characteristics are changed from those assumed herein, our recommendations must be reviewed to see whether any modifications are needed.

The subsurface exploration identified actual subsurface conditions only at the test locations. It was necessary to extrapolate these conditions to characterize the entire project site. For this reason, the subsurface conditions encountered during construction may vary somewhat from the test boring results and may in the extreme case, differ to the extent that modifications to the recommendations become necessary. Therefore, we recommend that AES be retained as the geotechnical consultant throughout the earth-related phases of the project to correlate actual soil conditions with the boring data, identify variations, conduct additional tests that may be needed and recommend solutions to earth-related problems that may develop during construction.

4.2 Subgrade Preparation

Proper subgrade preparation is essential for long-term performance of any pavement construction. Please note that improper earthwork may deteriorate an otherwise suitable subgrade. This is very important for this site as old fills with organics may deteriorate and become unstable if they are left exposed to moisture especially for a long period of time. Due to the presence of buried highly organic soils noted at Borings P-4 and S-1, which may result in uneven long-term settlements, the owner must realize that more than usual maintenance may be necessary in the pavement areas.

The time period between late spring and early fall are typically favorable for earthwork in the project area. Earthwork activities undertaken during late fall and winter often encounter substantial difficulties associated with snow, rain and cold temperatures.

In the pavement reconstruction areas, all existing pavement, exposed highly organic (over 4%), frozen, wet, soft, loose or otherwise unsuitable material should be removed. The excavations and mass grading should be performed in a manner consistent with good erosion and sediment control practice. Maintaining positive site drainage is an important part of successful earthwork operations and long-term performance. The contractor should maintain the construction area in a well-drained condition both during and after construction. Improper site drainage during grading operations can increase the need for remedial treatment of excessively wet soils.

To minimize percolation of rain water, disturbed areas should be sealed off with rubber tired or smooth drum roller at the end of each day and prior to anticipated inclement weather. Ditches must be kept open at all times, and the subgrade should be graded at the end of each day, to facilitate good drainage. It is recommended that the pavement construction be performed in segments to minimize deterioration of the subgrade.

After rough grade has been established and prior to placement of fill, the exposed subgrade should be surface compacted and proof-rolled in accordance with the ISS Section 203.26 before placement of any new fills. The purpose of the proof-rolling is to locate soft, weak, or excessively wet soils present at the surface or beneath a thin crust of relatively stronger soil during the construction. Unsuitable bearing soils encountered during the proof-rolling operations should be removed and replaced with suitable granular materials or stabilized adequately. The placement of fill should be accomplished in accordance with ISS Section 203.09. Structure fill material should be in accordance with ISS Section 211.02. Where new fill is to be placed on existing slopes, the fill should be benched into the existing embankments per the ISS.

The soil borings suggest that the subgrade soil consist of both clayey and granular soils with variable silt and organic contents. Depending on the weather conditions, these soils may become soft, loose and unstable under construction traffic particularly if the construction is performed immediately after precipitation or during colder temperatures. The extent to which this may be a problem is difficult to determine beforehand since it is dependent upon several factors including cut and fill depths, weather conditions, drainage provisions, variations in soil conditions across the site, sequencing and scheduling of the earthwork and construction traffic, etc.

Construction traffic must be controlled to minimize disturbance and deterioration of the subgrade. In general, yielding subgrade problems are more prominent in cut areas (where saturated or nearly saturated soils are exposed by the excavation) or where little or no fill is placed.

The pavement surface should be sloped to facilitate positive drainage and prevent surface water ponding. Edges of the pavement should provide a means of water outlet by extending the aggregate base through side ditches or drain pipes. The subgrade surface should be uniformly sloped to facilitate drainage through the granular base (if any) and to avoid any ponding of water beneath the pavement. Subsurface drains without filter fabric are recommended, if needed. Please note that inadequate surface and subsurface drainage often result in premature pavement failure.

There should be a contingency plan in case unstable and saturated subgrade soil is encountered during construction, as discussed earlier. An AES representative should be present throughout the earthwork to verify that they are performed as recommended and identify areas where special stabilization may be necessary.

4.3 Excavation and Slope Stability

There should not be any significant difficulties in excavating soils at this site with conventional equipment. Unless specified otherwise, all permanent cut slopes should be no steeper than 3 horizontal to 1 vertical. All temporary excavations should be properly laid back or braced in accordance with Occupational Safety and Health Administration (OSHA) requirements. Flatter cut slopes may be required in cases where there is ground water seepage or the foundation soils are particularly poor. Where new fill is placed against existing slopes that are steeper than 6 (horizontal) to 1 (vertical), a 10 ft wide bench is recommended into the existing slope to provide a good bond between the existing soil and the new fill and prevent the development of a weak zone at the interface. If spatial constraints will not permit an open cut, bracing will be required for any excavation deeper that 5 ft. Care must be exercised when excavating near the existing buildings, streets, underground utilities, etc., to protect the integrity of the existing facilities. Bracing may be required if it becomes necessary to excavate below and in close proximity to such facilities. All temporary bracing for deep excavations should be designed and installed by an experienced specialty contractor.

4.4 Engineered Fill

We understand that the project may require minimal cut and fill to achieve finished grade. Once the subgrade has been properly prepared as per the above guidelines, new fills may be placed in order to attain desired final grades. In general, any non-organic, non-expansive soils can be used for engineered fill that meets the requirements for INDOT Structural Fill (ISS, Section 904.05).

Engineered fill should be placed in lift thicknesses not to exceed about 8 inches and compacted to a minimum of 95% of the standard Proctor maximum dry density (ASTM D698). Aggregate base, however, should be compacted to at least 100% of the same Proctor density. Filling should be done in thin lifts in accordance with Section 203.09 of the INDOT Standard Specifications. It is likely that some drying of the fill material will be required before being placed in order to meet the INDOT Specification for fill placement. It is probable that this will also be the case for most of the soil materials encountered within the range of subgrade treatment. A granular material may be necessary to satisfy the minimum compaction requirements.

It is recommended that AES be retained to perform continuous review of construction of the soils related phases of this project. Otherwise, we can assume no responsibility for construction compliance with the design concepts, specifications, or our recommendations. As part of this review, field density tests should be performed frequently to assist in the evaluation of the fill with respect to the above recommendations.

4.5 Groundwater Control

Since groundwater was noted as shallow as about 3.5 ft and may rise, the contractor must be prepared to handle both surface and groundwater during excavations. If water accumulates or ponds in the construction area, it should be promptly and properly removed. Generally, well points or cased-wells installed outside the excavation limits are necessary to lower groundwater in saturated granular soils. We recommend that groundwater be lowered to at least 2 ft below the lowest excavation level, if necessary. An experienced dewatering contractor should be hired to design and install dewatering system, if necessary. Improper dewatering may deteriorate the subgrade or adversely affect nearby structures.

4.6 Discussion on Infiltration

As requested, field infiltration tests were completed near Borings S-1, S-2 and S-3 and the results are summarized below:

Table-4.1: Summary of Field Infiltration Test Results

Boring No.	Infiltration Test Depth, ft	Depth of Observed Ground Water, ft	Approximate Field Infiltration Rate (inch/hour)
S-1	2	3.5	1.0
S-2	2	3.5	2.5
S-3	2	4.5	0.5

Please note that the above rates are field values and an appropriate safety factor (typically on the order of 2 to 2.5) must be incorporated in any design. It should be noted that the field infiltration rates especially in old fills should be expected to vary significantly due to the presence of miscellaneous materials, horizontal and vertical variations and inherent inconsistencies, variation in groundwater level, fine contents in the old fills, etc. Similarly, due to the variation in the fine contents, field infiltration rates in the underlying natural sandy soils should be expected vary throughout the site. The designer must consider the variation of the percolation rates during the design.

Since groundwater was noted as shallow as about 3.5 ft below existing grade and may rise seasonally, this will reduce the availability of infiltration zones. No percolation should be assumed below groundwater level.

The native poorly graded sandy soils noted at shallow depths above groundwater appears to be moderately conducive to absorb some of the stormwater by infiltration method. It should be noted that the subsurface soil and groundwater conditions may change over time, such as a seasonal rise in the water level and a decrease in the permeability of the subgrade soils due to intrusion of fines transported by the storm water into the soils.

It should be noted that the subsurface soil and groundwater conditions may change over time, such as a seasonal rise in the water level and a decrease in the permeability of the subgrade soils due to intrusion of fines transported by the storm water into the soils. Therefore, it is recommended that any storm water infiltration system should include measures for clearing as well as a suitable alternate outfall should the system performance be diminished or impaired, and for the case when the groundwater is at a level higher than the base of the infiltration element. It is also recommended that the storm water infiltration elements be located as far away from any structures, as possible.

4.7 Pavement Design Recommendations

Although no details are available, we assume that the proposed pavement reconstruction areas will consist of either asphalt (surface, intermediate and base courses) or concrete underlain by granular aggregate base. The anticipated subgrade soils revealed by the test borings appear to be generally suitable to support the proposed pavement, provided they are prepared as discussed in Section 4.1 of this report. Please note that all pavements require regular maintenance and repair over time due to the normal wear and tear.

Due to the presence of buried highly organic soils noted at Borings P-4 and S-1 that may result in uneven long-term settlements, the owner must realize that more than usual maintenance may be necessary for any pavement areas.

If the existing pavement are milled and resurfaced (rather than reconstruction), we recommend that the existing pavement be carefully observed for cracking, deterioration other type of failure. Any portions of the pavement that exhibit cracks, distress or failure should be removed and re-constructed for long-term performance.

In the pavement reconstruction areas, all existing pavement, vegetation, highly organic (over 5%) and otherwise unsuitable materials should be removed and replaced with suitable granular material prior to the placement of new fill, aggregate base. It should be noted that the existing subgrade may deteriorate and become unstable if they are left exposed to moisture. Once the subgrade elevation is reached, it should be proof-rolled as discussed in Section 4.1 of this report.

Any unsuitable materials revealed by the proof-roll should be replaced or adequately stabilized, as discussed earlier. An AES representative should be present to verify that the subgrade is prepared properly as prescribed in this report.

The pavement surface should be sloped to facilitate positive drainage and prevent surface water ponding on the pavement. Edges of the pavement should provide a means of water outlet by extending the aggregate base through side ditches or drain pipes. The subgrade surface should be uniformly sloped to facilitate drainage through the granular base and to avoid any ponding of water beneath the pavement. Subsurface drains without filter fabric are recommended, if needed. Please note that inadequate surface and subsurface drainage often results in premature pavement failure.

The following design parameters are recommended for the pavement design:

Table 4.2: Summary of Pavement Design Parameters

Parameter	Recommended Value
Estimated Natural Subgrade Soil Resilient Modulus	4,500 lbs./sq.in.
Recommended Subgrade Treatment, if needed	Type IC (12 inches of INDOT 53)
Approximate Groundwater Table	3.5 ft
Most Critical & Predominant Natural Subgrade Soil	Sand (Fill)

The aggregate base materials should be well-graded granular materials conforming to INDOT Coarse Aggregate No. 53 in accordance with the Indiana Department of Transportation (INDOT) Standard Specifications. The asphaltic concrete pavement should be constructed in accordance with the INDOT Standard Specifications Section 401-Hot Mix Asphalt, HMA, Pavement.

4.8 Drainage

Adequate drainage must be provided at the site to minimize any increase in moisture content of the foundation soils. Exterior grades should be sloped away from the structure to prevent ponding of water near foundations. Water from gutters must be diverted away from the structures to minimize ponding of water near the foundations.

5.0 LIMITATIONS OF STUDY

Differing Site Conditions

Geotechnical engineering recommendations were developed based on the information obtained from the test borings at the site. Please note that soil test borings only depict the subsurface soil and groundwater conditions at the specific locations and time at which they were made. The soil conditions at other locations at the site may differ from those occurring at the soil boring locations. Groundwater condition may change over time. If deviations from the noted subsurface conditions are encountered during construction, please notify us immediately for recommendations.

Not Final Design

This report and the recommendations included in the report are not a final design, but rather as a basis for the final design to be completed by others (architect, civil or structural engineers, etc.). It is the client's responsibility to ensure that the recommendations are properly integrated into the design, and that the geotechnical engineer is provided the opportunity for design input and comment, as needed. We recommend that this firm be retained to review the final construction documents to confirm that the proposed project design sufficiently reflects the recommendations presented in the report. We also suggest that our firm be represented at pre-bid and/or pre-construction meetings regarding this project to offer any needed clarification of the geotechnical information to all involved.

Changes in Plans

The recommendations presented herein are based on the preliminary design details furnished by the client and/or as assumed herein. Any revision in the plans for the proposed construction from those anticipated in this report should be brought to the attention of the geotechnical engineer to determine whether any changes in the foundation or earthwork recommendations are necessary.

Construction Issues

Although general constructability issues have been considered in this report, the means, methods, techniques, sequences and operations of construction, safety procedure, and all items incidental thereto and consequences of, are the responsibility of parties to the project other than AES. Please contact us if additional guidance is needed.

Report Interpretation

AES is not responsible for the conclusions, opinions, or recommendations made by others based upon the data included herein. It is the client's responsibility to seek any guidance and clarifications from the geotechnical engineer needed for proper interpretation of this report.

Environmental Considerations

The scope of our services does not include any environmental assessment or exploration for the presence or absence of hazardous or toxic materials in the soil, surface or groundwater, water within or beyond the site studied. Unless complete environmental information regarding the site is already available, an environmental assessment is recommended prior to the development of this site.

Standard of Care

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This statement is made in lieu of all other warranties either expressed or implied.

APPENDIX

BORING LOCATION PLAN

TEST BORING LOGS

LABORATORY TEST RESULTS

FIELD CLASSIFICATION SYSTEM

ORIGINAL DRAWING PROVIDED BY CLIENT
ALL TEST LOCATIONS ARE APPROXIMATE

BORING LOCATION PLAN

PROPOSED IMPROVEMENTS AT
CHARLES N. SCOTT MIDDLE SCHOOL
3635 173RD STREET
HAMMOND, INDIANA
CLIENT: SCHOOL CITY OF HAMMOND

PROJECT NUMBER: 2021-1028

DRAWN BY: JV

DATE: 04-02-21

SCALE: NONE

APPROVED: AZ

aes
advanced engineering services

Figure:
1

Advanced Engineering Services
7439 Calumet Avenue
Hammond, IN, 46324
Telephone: 219 933 7888

BORING NUMBER P-1

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CLIENT School City of Hammond
PROJECT NAME Proposed Improvements at Charles N. Scott Middle School
PROJECT NUMBER 2021-1028G
PROJECT LOCATION 3635 173rd Street, Hammond, Indiana
DATE STARTED 3/30/21 **COMPLETED** 3/30/21
GROUND ELEVATION 602 ft **HOLE SIZE** 4 inches
DRILLING CONTRACTOR GTC
GROUND WATER LEVELS:
DRILLING METHOD HSA
▽ **AT TIME OF DRILLING** 3.50 ft / Elev 598.50 ft
LOGGED BY AL **CHECKED BY** JV
▼ **AT END OF DRILLING** 4.00 ft / Elev 598.00 ft
NOTES Ground elevations were estimated from Google Earth.
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONF. COMP STRENGTH (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0	▨	Asphalt - 3 in., Sand and Gravel - 6 in.										
	▨	(FILL) Dark Brown to Black Sand, Trace Organics SS#1: Organic Content = 2.3%	☒ SS 1	☒	4-6-5 (11)			13.4				
2.5	▨											
	░	▽ (SP) Gray Poorly Graded Sand, Trace Gravel, Wet, Loose ▼	☒ SS 2	☒	3-4-3 (7)							
5.0												

Bottom of borehole at 5.0 feet.

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7439 Calumet Avenue
Hammond, IN, 46324
Telephone: 219 933 7888

BORING NUMBER P-2

PAGE 1 OF 1

CLIENT School City of Hammond

PROJECT NAME Proposed Improvements at Charles N. Scott Middle Schoo

PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 601 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

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DRILLING METHOD HSA

∇ **AT TIME OF DRILLING** 3.50 ft / Elev 597.50 ft

LOGGED BY AL **CHECKED BY** JV

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONF. COMP STRENGTH (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0	▨	Asphalt - 1 in., Sand and Gravel - 4 in.										
		(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Loose										
			SS 1	☒	5-5-5 (10)							
2.5												
		∇										
		▼	SS 2	☒	3-4-5 (9)							
5.0												

Bottom of borehole at 5.0 feet.

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Hammond, IN, 46324
Telephone: 219 933 7888

BORING NUMBER P-3

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CLIENT School City of Hammond

PROJECT NAME Proposed Improvements at Charles N. Scott Middle School

PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 602 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ **AT TIME OF DRILLING** 3.50 ft / Elev 598.50 ft

LOGGED BY AL **CHECKED BY** JV

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NOTES Ground elevations were estimated from Google Earth.

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONF. COMP STRENGTH (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0	▨	Asphalt - 1 in., Sand and Gravel - 10 in.										
		(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Very Loose to Dense	SS 1	☒	5-7-6 (13)							
2.5		▽ ▼	SS 2	☒	2-2-3 (5)							
5.0												

Bottom of borehole at 5.0 feet.

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BORING NUMBER P-4

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CLIENT School City of Hammond

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PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

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									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Asphalt - 1 in., Sand and Gravel - 9 in.										
		(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Loose	SS 1		5-5-5 (10)							
2.5												
	▼ ▽	(ML) Dark Brown to Black Sandy Silt, With Organics, Wet, Loose SS#2: Organic Content = 13.3%	SS 2		1-3-5 (8)			66.9				
5.0		(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Loose										

Bottom of borehole at 5.0 feet.

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BORING NUMBER P-5

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CLIENT School City of Hammond

PROJECT NAME Proposed Improvements at Charles N. Scott Middle School

PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 602 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ **AT TIME OF DRILLING** 3.50 ft / Elev 598.50 ft

LOGGED BY AL **CHECKED BY** JV

▼ **AT END OF DRILLING** 4.00 ft / Elev 598.00 ft

NOTES Ground elevations were estimated from Google Earth.

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT	ATTERBERG LIMITS PLASTIC LIMIT	ATTERBERG LIMITS PLASTICITY INDEX	UNCONF. COMP STRENGTH (psf)
0.0	▩	Asphalt - 1 in., Sand and Gravel - 14 in.										
	∴	(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Medium Dense	SS 1	☒	5-8-8 (16)							
2.5	∴											
	∴	▽ ▼										
	∴	(SP) Gray Poorly Graded Sand, Trace Gravel, Wet, Very Loose	SS 2	☒	2-2-3 (5)							
5.0												

Bottom of borehole at 5.0 feet.

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BORING NUMBER S-1

PAGE 1 OF 1

CLIENT School City of Hammond

PROJECT NAME Proposed Improvements at Charles N. Scott Middle School

PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 602 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

GROUND WATER LEVELS:

DRILLING METHOD HSA

∇ **AT TIME OF DRILLING** 4.50 ft / Elev 597.50 ft

LOGGED BY AL **CHECKED BY** JV

▼ **AT END OF DRILLING** 3.50 ft / Elev 598.50 ft Cave at 5 ft.

NOTES Ground elevations were estimated from Google Earth.

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT	ATTERBERG LIMITS PLASTIC LIMIT	ATTERBERG LIMITS PLASTICITY INDEX	UNCONF. COMP STRENGTH (psf)
0.0		(FILL) Dark Brown to Black Sandy Clay, Trace Organics										
		(Fill) Dark Brown to Black Silty Sand, Trace Gravel and Organics, Moist, Very Loose SS#1: Organic Content = 3.5%	SS 1		2-2-1 (3)			24.4				
2.5		(SP) Gray Poorly Graded Sand, Trace Gravel, Wet, Very Loose to Loose										
		▼ ∇	SS 2		1-2-2 (4)							
5.0												
			SS 3		4-4-4 (8)							
7.5												
		(ML) Dark Brown to Black Sandy Silt, With Organics, Wet, Loose SS#4: Organic Content = 11.7%	SS 4		2-4-6 (10)			46.6				
10.0		(SP-SM) Gray Poorly Graded Sand with Silt, Trace Gravel, Wet, Medium Dense										
			SS 5		3-7-11 (18)							
12.5												
			SS 6		11-13-14 (27)							
15.0												

Bottom of borehole at 15.0 feet.

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BORING NUMBER S-2

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CLIENT School City of Hammond

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PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 601 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ **AT TIME OF DRILLING** 3.50 ft / Elev 597.50 ft

LOGGED BY AL **CHECKED BY** JV

▼ **AT END OF DRILLING** 3.50 ft / Elev 597.50 ft Cave at 5 ft.

NOTES Ground elevations were estimated from Google Earth.

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS LIQUID LIMIT	ATTERBERG LIMITS PLASTIC LIMIT	ATTERBERG LIMITS PLASTICITY INDEX	UNCONF. COMP STRENGTH (psf)
0.0	▩	(FILL) Dark Brown to Black Sandy Clay, Trace Organics										
	⁘	(SP) Brown Poorly Graded Sand, Trace Gravel, Moist to Wet, Loose to Medium Dense	SS 1		4-5-5 (10)							
2.5	⁘											
	⁘	▼	SS 2		2-5-6 (11)							
5.0	⁘											
	⁘	(SP) Gray Poorly Graded Sand, Trace Gravel, Wet, Loose to Medium Dense	SS 3		2-4-6 (10)							
7.5	⁘											
	⁘		SS 4		3-5-8 (13)							
10.0	⁘											
	⁞	(SM) Gray Silty Sand, Trace Gravel, Wet, Medium Dense	SS 5		3-9-15 (24)							
12.5	⁞											
	⁞		SS 6		6-11-13 (24)							
15.0	⁞											

Bottom of borehole at 15.0 feet.

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BORING NUMBER S-3

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CLIENT School City of Hammond

PROJECT NAME Proposed Improvements at Charles N. Scott Middle School

PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana

DATE STARTED 3/30/21 **COMPLETED** 3/30/21

GROUND ELEVATION 602 ft **HOLE SIZE** 4 inches

DRILLING CONTRACTOR GTC

GROUND WATER LEVELS:

DRILLING METHOD HSA

▽ **AT TIME OF DRILLING** 6.00 ft / Elev 596.00 ft

LOGGED BY AL **CHECKED BY** JV

▼ **AT END OF DRILLING** 4.50 ft / Elev 597.50 ft Cave at 5 ft.

NOTES Ground elevations were estimated from Google Earth.

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY %	STD. PEN. TEST SPT (N VALUE)	HAND PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONF. COMP STRENGTH (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		(FILL) Dark Brown to Black Sandy Clay, Trace Organics										
		SS#1: Organic Content = 9.3%	SS 1		3-2-2 (4)			51.6				
2.5		(SP) Brown Poorly Graded Sand, Trace Gravel, Moist, Very Loose										
			SS 2		2-1-3 (4)							
	▼	(SP) Gray Poorly Graded Sand, Trace Gravel, Moist to Wet, Very Loose to Loose										
5.0												
	▽											
			SS 3		2-2-5 (7)							
7.5												
			SS 4		5-5-5 (10)							
10.0												
		(SP-SM) Gray Poorly Graded Sand with Silt, Trace Gravel, Wet, Medium Dense	SS 5		3-9-12 (21)							
12.5												
			SS 6		4-10-10 (20)							
15.0												

Bottom of borehole at 15.0 feet.

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GRAIN SIZE DISTRIBUTION

CLIENT School City of Hammond

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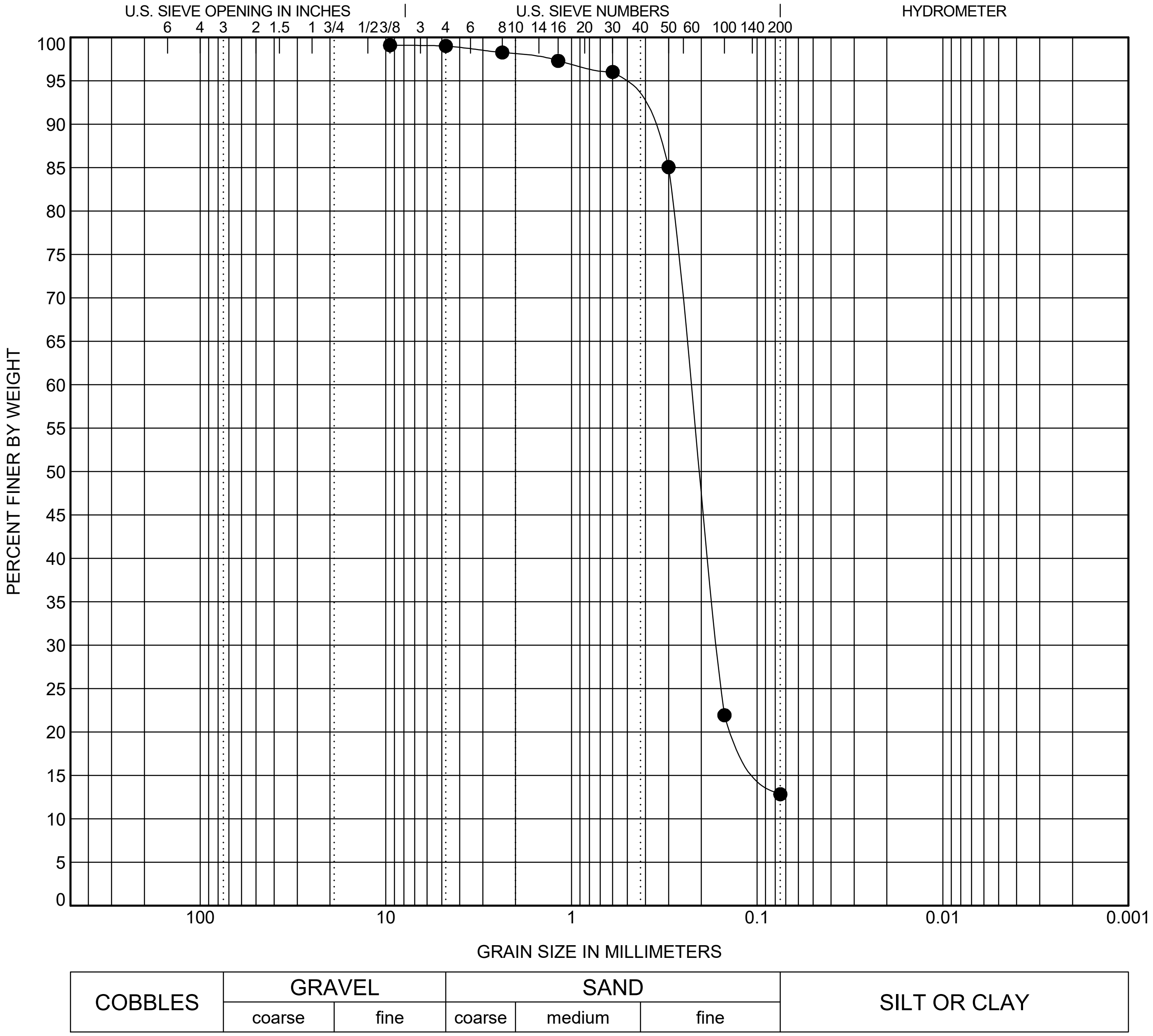
PROJECT NUMBER 2021-1028G

PROJECT LOCATION 3635 173rd Street, Hammond, Indiana



BOREHOLE		DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**S-1**	**1.0**	**SILTY SAND(SM)**					

BOREHOLE		DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**S-1**	**1.0**	**9.5**	**0.228**	**0.164**		**0.1**	**86.2**	**12.8**	

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GRAIN SIZE DISTRIBUTION

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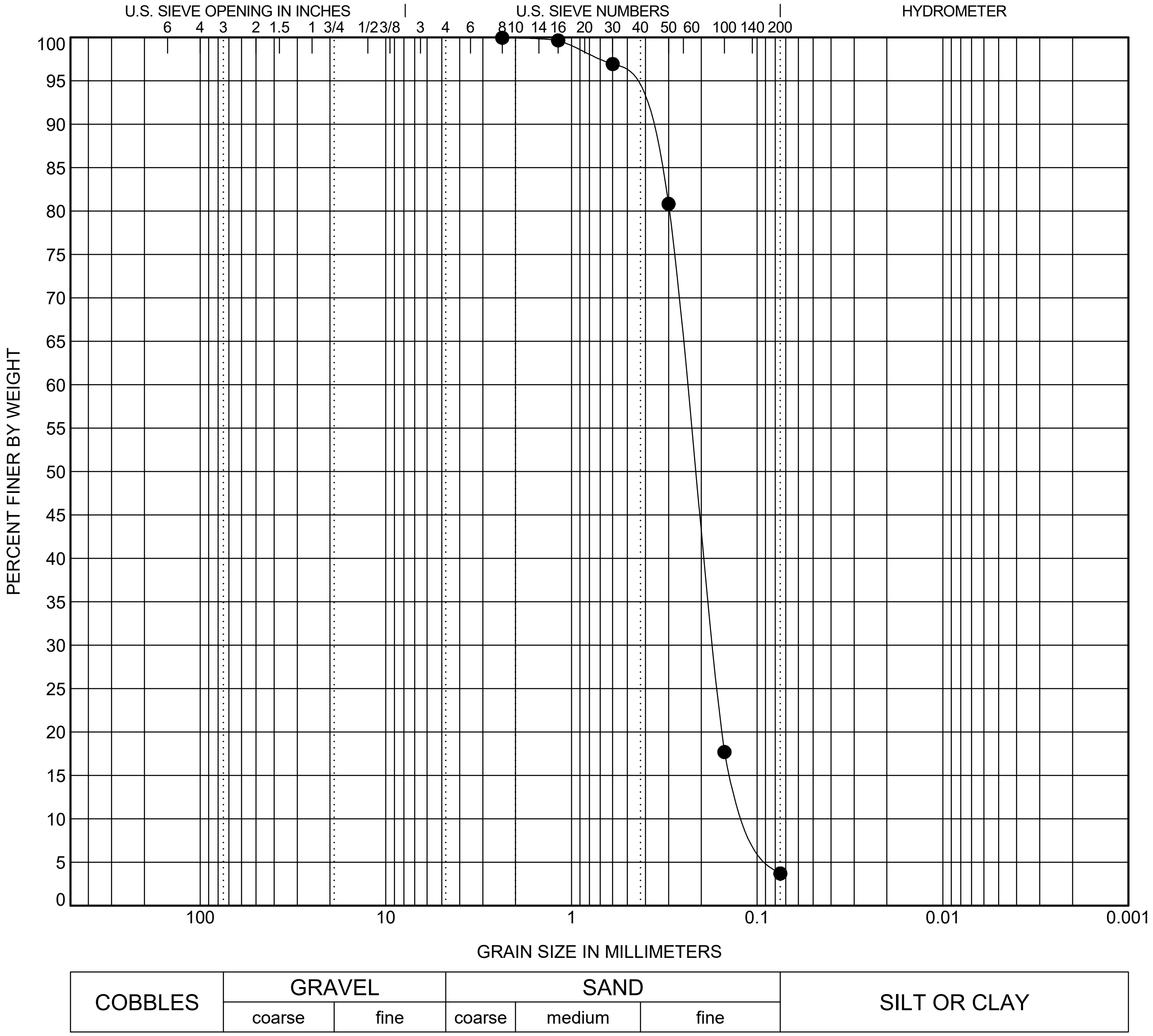

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**S-2**	**1.0**	**POORLY GRADED SAND(SP)**				**1.21**	**2.33**

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**S-2**	**1.0**	**2.36**	**0.239**	**0.172**	**0.102**		**96.3**	**3.7**	

GRAIN SIZE - GINT STD US LAB.GDT - 4/2/21 14:36 - H:\2021\1028G SCOTT MIDDLE SCHOOL\SCOTT MIDDLE SCHOOL.GPJ

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GRAIN SIZE DISTRIBUTION

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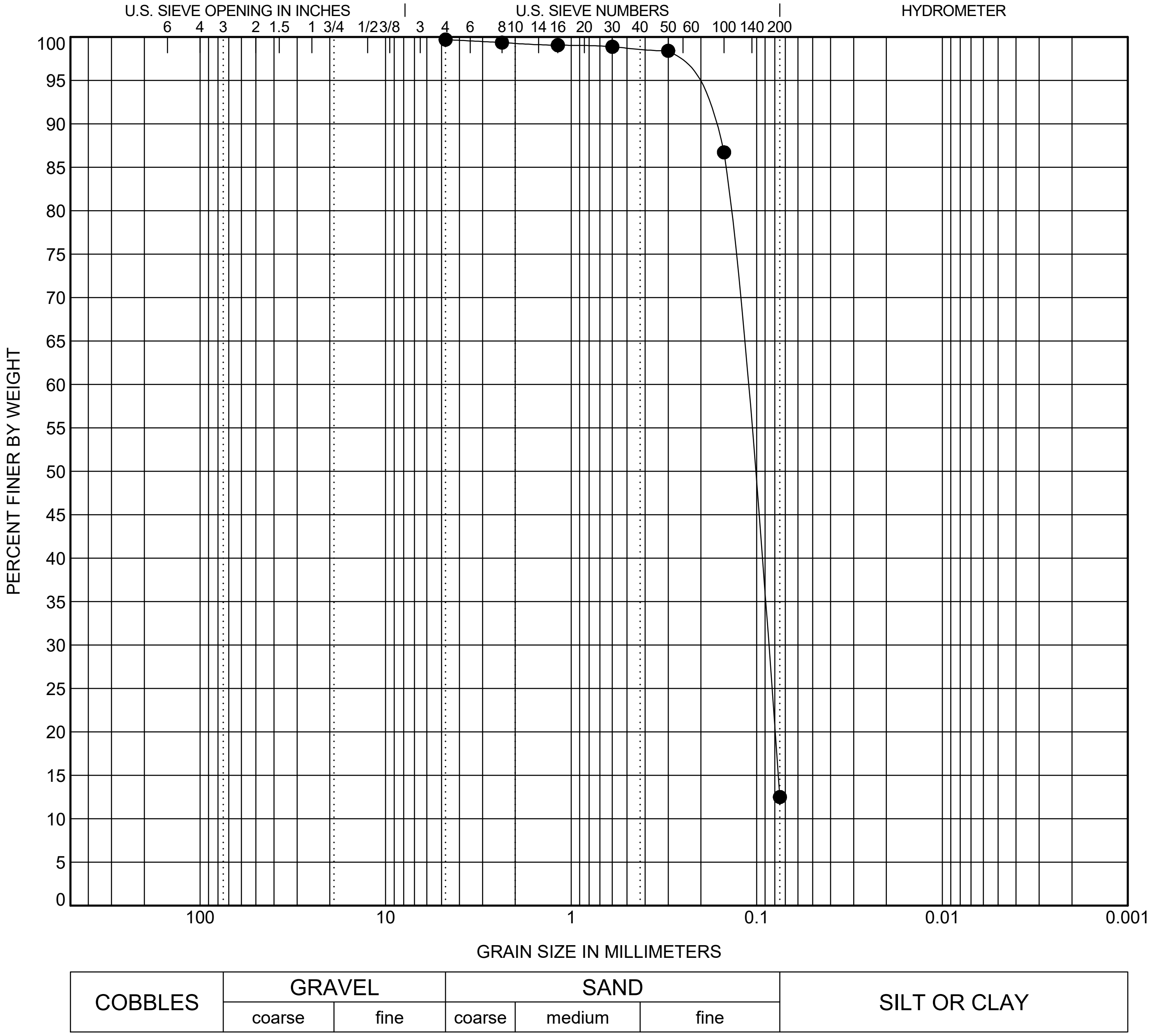

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **S-2**	**13.5**	**SILTY SAND(SM)**				**0.91**	**1.60**

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **S-2**	**13.5**	**4.75**	**0.117**	**0.088**			**87.2**	**12.5**	

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GRAIN SIZE DISTRIBUTION

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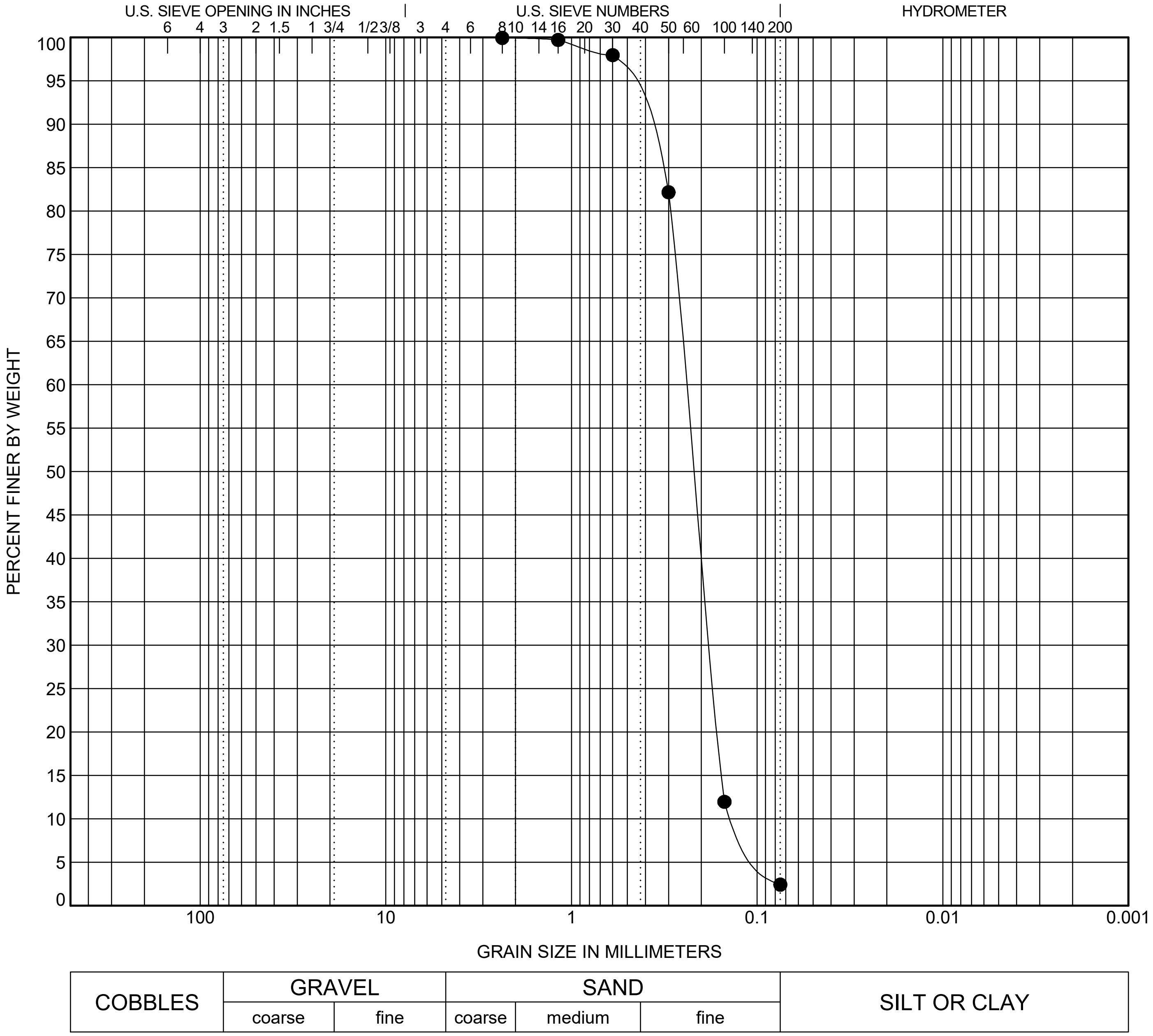

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**S-3**	**3.5**	**POORLY GRADED SAND(SP)**				**1.02**	**1.85**

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**S-3**	**3.5**	**2.36**	**0.241**	**0.179**	**0.13**		**97.5**	**2.4**	

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FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON-COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density

Very Loose	5 blows/ft or less
Loose	6 to 10 blows/ft
Medium Dense	11 to 30 blows/ft
Dense	31 to 50 blows/ft
Very Dense	51 blows/ft or more

Relative Proportions

Descriptive	Percent
Trace	1 to 10
Little	11 to 20
Some	21 to 35
And	36 to 50

Particle Size Identification

Boulders	12 inch diameter or more	
Cobbles	12 to 3 inch diameter	
Gravel	Coarse	3 to 3/4 inch
	Fine	3/4 inch to 4.75mm (No. 4)
Sand	Course	4.75mm to 2mm (No. 10) (dia. Of pencil lead)
	Medium	2.00mm to 0.425mm (No.40) (Dia. of broom straw)
	Fine	0.425mm to 0.075mm (No.200) (dia. of human hair)
Silt/Clay		0.075mm or Smaller (cannot see particles)

COHESIVE SOILS
(Clay, Silt and combinations)

Consistency

Very Soft	3 blows/ft or less
Soft	4 to 5 blows/ft
Medium Stiff	6 to 10 blows/ft
Stiff	11 to 15 blows/ft
very Stiff	16 to 30 blows/ft
Hard	31 blows/ft or more

Plasticity

Degree of Plasticity	Plasticity Index
None to slight	0 to 4
Slight	5 to 7
Medium	8 to 22
High to Very High	over 22

Classification on logs are made by visual inspection of samples.

Standard Penetration Test (SPT)- Driving a 2.0" O.D. 1-3/8" I.D. sampler a distance of 1ft into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary for ATC to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6.0 inches of penetration on the drill log (Example-6/8/9). The standard penetration test result can be obtgained by adding the last two figures (i.e., 8+9=17 blows/ft). (ASTM D-1586-08).

Stara Changes - In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (____) represents an actually observed change. A dashed line (_ _ _ _) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topographjy, etc,, may cause changes in the water levels indicated on the logs.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	●	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
			○	GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	○	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			▨	GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	⁙	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			░	SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	░	SM	SILTY SANDS, SAND - SILT MIXTURES
			▨	SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	▥	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			▨	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			☰	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	▥	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			▨	CH	INORGANIC CLAYS OF HIGH PLASTICITY
			≋	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			⁂	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS