

SECTION – 00 31 19 - EXISTING CONDITION INFORMATION

PART 1 - Existing Condition Information

1.1 EXISTING CONDITION INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. Existing drawings that include information on existing conditions at Project site are available for viewing on Project ShareFile site and at the office of Architect.
- C. Survey information that includes information on existing conditions, prepared by G.D. Houtmann & Son, Inc., is available for viewing upon request to the Project Architect.
- D. Related Requirements:
 - 1. Document 00 21 13 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
 - 2. Document 00 31 32 "Geotechnical Data" for reports and soil-boring data from geotechnical investigations that are made available to bidders.

END OF SECTION 00 31 19

SECTION – 00 31 32 - GEOTECHNICAL DATA

PART 1 - GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. Because subsurface conditions indicated by soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.
- C. A geotechnical investigation report for Project, prepared by Earth Engineering, Inc., dated 12 September, 2022 follows.
 - 1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
 - 2. Any party using information described in the geotechnical report shall make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.
- D. Related Requirements:
 - 1. Document 00 21 13 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
 - 2. Document 00 31 19 "Existing Condition Information" for information about existing conditions that is made available to bidders.

END OF SECTION 00 31 32



REPORT OF GEOTECHNICAL INVESTIGATION

PROPOSED THREE ONE - STORY ADDITIONS TO EXISTING SCHOOL BUILDING

**701 HENDERSON BLVD.
FOLCROFT, DELAWARE COUNTY, PENNSYLVANIA**

Prepared For:

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I. INTRODUCTION

A. PROJECT OBJECTIVE AND SCOPE OF WORK

Earth Engineering Incorporated (EEI) has completed a geotechnical investigation for the proposed three-story additions to the existing school building, located at 701 Henderson Blvd, Folcroft, Pennsylvania. Based on the encountered conditions and the results of the testing performed for this project, EEI has developed geotechnical recommendations to aid in the foundation design for the proposed structure, as well as general earthwork and construction guidelines for the development of the site.

This investigation was performed in general accordance with EEI proposal BB-20899, dated June 27, 2022. The scope of work conducted for this investigation included a test boring investigation, a geologic analysis of site conditions, laboratory testing of soil samples, and geotechnical engineering analysis of the data obtained. This report presents the results of the field and laboratory investigations and documents our recommendations regarding the geotechnical engineering aspects of this project.

B. SITE AND PROJECT DESCRIPTION

The subject site is located at 701 Henderson Blvd., Folcroft, Pennsylvania. The site is currently a parking lot bounded by Delmar Drive to the North. Henderson Blvd to the West, Delaware County Technical High School to the south, and residential areas to the east. The location of the approximate development area is indicated on Figure 1 below. A topographic map of the site is attached as Plate 1 in the APPENDIX of this report.

Three, one story additions are proposed around the existing technical high school as shown in figure 1. The proposed additions are located to the east (Area A), west (Area C), and south (Area D/E). A drawing provided to EEI, titled "Proposed Test Boring Locations" by Marotta/Main Architects, dated March 18, 2022, was used to determine approximate Test Boring locations, as well as approximate ground surface elevations for the borings.

Based on correspondence from the project team, the lowest level finished floor elevation (FFE) will be between the existing building elevations of approximately 38.0 to 40.0 feet (ground surface elevation at the proposed entrance) is assumed. Structural loads were provided to EEI from the project structural engineer the Joseph Barbato Associates (JBA). The maximum column loads for the proposed buildings vary in the order of 40kips for addition D/E to 380 kips for additions A and C, and maximum wall loads vary in the order of 2.5 kips per linear foot (klf) for addition D/E, 2 klf for addition A, and 4 klf for addition C. Should the final loads vary significantly



from these loads, EEI should be contacted immediately so that the recommendations provided herein can be verified.

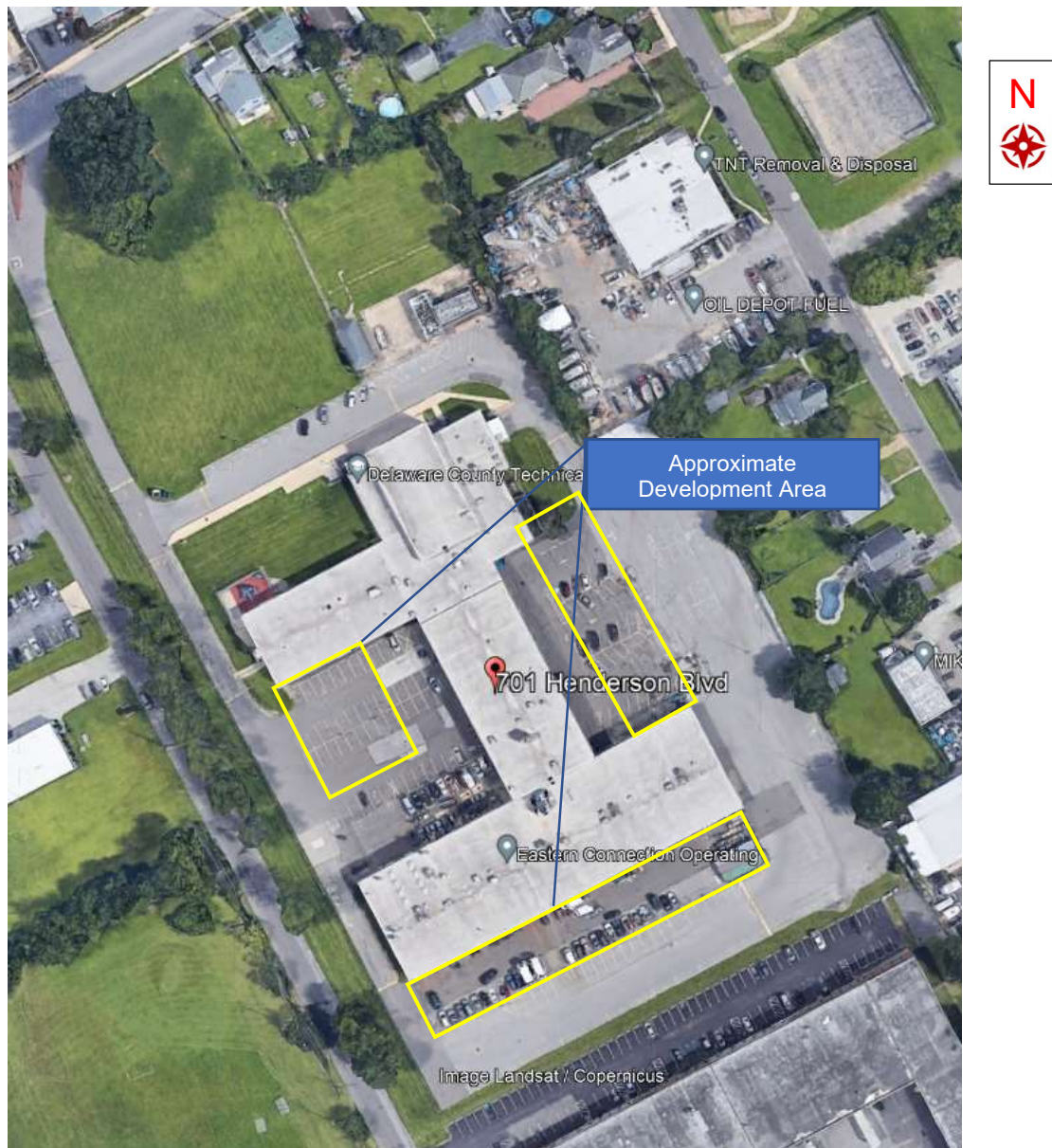


FIGURE 1 – Aerial View of Site, Google 2018

FIELD INVESTIGATION, OBSERVATIONS, AND DATA

TEST BORINGS

Fourteen test borings, designated based on their respective areas as B-E1 to B-E5, B-W1 to B-W4, to B-S1 to B-S5, were used to explore the subsurface conditions within the proposed development area. The borings were completed on August 4th through August 5th, 2022, by

SANO Drilling Incorporated, with a Diedrich D-50 truck mounted drill rig with a powered cathead with rope and pulley system and safety hammer. Supervision and monitoring of the boring program were performed by a representative of EEI. The boring locations were field located by EEI using existing site features. Surface elevations at the boring locations were estimated from the topographic contours presented on the aforementioned Proposed Plan. The boring locations are depicted on the Testing Location Plan, EEI Drawing No. 35037.00-A-101, which is included in the APPENDIX of this report for reference. The site was investigated as thoroughly as could be based on the available areas accessible to the drilling equipment.

The borings were advanced using 2-inch outer-diameter, split-barrel (spoon) samplers and 3.25 inch inner-diameter hollow-stem augers. The borings were conducted in accordance with ASTM Standard D1586. Standard Penetration Test (SPT) values were recorded for each sample. The SPT values, which are a measure of soil density and consistency, are the number of blows required to drive the 2-inch outer diameter split-barrel sampler 1 foot using a 140-pound weight dropped 30 inches. The number of blows required to advance the sampler over the 12-inch interval from 6 to 18 inches is considered the "N" value, or the SPT value. Detailed descriptions and data regarding the subsurface conditions are shown on the *Boring Logs* which are included in the APPENDIX.

The borings were conducted to approximate depths ranging from 11.0 feet to 15.0 feet below existing grade. Bedrock, defined herein by auger refusal within residual materials was encountered in all borings. Graphical representations of the stratigraphy encountered are shown on the Boring Profiles. Detailed descriptions and data regarding the subsurface conditions are shown on the Boring Logs which are included in the APPENDIX.

Groundwater measurements were taken after each test boring was completed and at the end of each boring. Groundwater was encountered within three (3) of the fourteen (14) test boring locations. It is believed this is perched water above the weathered rock.

Boring Logs, which provide sample depths, descriptions of the materials encountered and sampling data, are included in the APPENDIX of this report. The information presented on the logs was used to generate Boring Profiles that graphically represent the subsurface conditions encountered at each boring location.

GEOTECHNICAL LABORATORY TESTING

Four (4) representative samples of the soil recovered from the field investigation were tested in the laboratory to confirm field classification. The soil sample was tested in accordance



with ASTM D2487. The tests performed included Particle Size Analysis (ASTM D422), Atterberg Limits (ASTM D4318), and Natural Moisture Content (ASTM D2216). A Unified Soil Classification System (USCS) Group Symbol and an ASTM Group Name have been assigned to the soil sample based upon the results of the laboratory testing.

The results of the laboratory testing are presented in Table I. Gradation curves, which graphically and numerically depicts the results of the analyses, is included in the APPENDIX.

TABLE I		
LABORATORY TEST RESULTS		
Sample Location	B-W4, S-3 B-E4, S-3	B-S1, S-5 B-E4, S-5
Sample Depth	4.0' – 6.0'	8.0' – 10.0'
Stratum	Stratum I	Stratum III
Atterberg Limits: Liquid Limit/ Plastic Limit/ Plasticity Index	Non-Plastic	Non-Plastic
Percent Passing No.200 Sieve (%)	92.1	30.5
Natural Moisture Content (%)	20.7	17.2
Unified Soil Classification System (USCS) Group Symbol/ Name	ML, Silt	SM, Silty Sand
Sample Location	B-S2, S-5 B-W4, S-5	B-E4, S-2 B-S2, S-2
Sample Depth	8.0' – 10.0'	2.0' – 4.0'
Stratum	Stratum III	Stratum I
Atterberg Limits: Liquid Limit/ Plastic Limit/ Plasticity Index	Non-Plastic	30 / 20 / 10
Percent Passing No.200 Sieve (%)	37.1	87.2
Natural Moisture Content (%)	24.3	21.3
Unified Soil Classification System (USCS) Group Symbol/ Name	SM, Silty Sand	CL, Lean Clay

PUBLISHED GEOLOGICAL INFORMATION

According to the Pennsylvania Geologic Survey, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, Lansdowne PA Quadrangle, 1978, the project site is underlain by the



Wissahickon Formation (geologic symbol - Xw) near contacts with the Pensauken and Bridgeton Formations undifferentiated (geologic symbol - Tpb) to the north and the Trenton Gravel Formation (geologic symbol - Qt) to the south. Based upon the material observed during the field investigation, the natural soil conditions appeared typical of the alluvial soils of either the Pensauken and Bridgeton and/or Trenton Gravel Formations situated above the residual soil/weathered rock of the Wissahickon Formation. Plate 2, included in the Appendix, shows the location of the site on a geologic map of the area.

As noted in the Commonwealth of Pennsylvania, Topographic and Geologic Survey, *Engineering Characteristics of The Rocks of Pennsylvania*, Fourth (4th) Series, Revised 1982, the metamorphic Wissahickon Formation (Xw) is typically composed of a mica-schist. This rock is characterized by its distinct foliation which is caused by the preferential orientation of muscovite, feldspar and quartz. The foliation within this formation is typically well developed, fissile to thin. This rock type is moderately resistant to weathering and the overlying soil mantle is typically thin. In comparison to other rock types, the ease of excavation ranges from easy in completely weathered rock to difficult in slightly to fresh weathered rock. Groundwater springs and quartz boulders are common occurrences within this formation.

Based upon the materials observed during the field investigation, the residual soil conditions at the site appeared typical of the weathering of the schist of the Wissahickon Formation.

As noted in the Pennsylvania Geological Survey, *Engineering Characteristics of The Rocks of Pennsylvania*, Fourth Series, Revised 1982, the Pensauken and Bridgeton Formations are composed of yellow to reddish brown cross-bedded clayey sand with interbedded quartz, chert and quartzite gravels. These formations are well-bedded and cross-bedded. This formation is deeply weathered. Excavation is generally easy in comparison to other rock types.

Also noted in the Commonwealth of Pennsylvania, Topographic and Geologic Survey, *Engineering Characteristics of The Rocks of Pennsylvania*, Fourth (4th) Series, Revised 1982, the Trenton Gravel is composed of a gray to reddish-brown very gravelly sand with interbedded sand and clay/silt layers. This formation is typically well bedded and exhibits some cross bedding. The Trenton Gravel Formation, which was deposited by the Delaware River, typically features good surface drainage and high porosity and permeability. Boulders are a common occurrence in this formation. If these boulders are encountered, excavation difficulties may be experienced.



III. STRATIFICATION AND SUBSURFACE CONDITIONS

A. SOIL STRATA

The soil samples recovered during the field investigation were examined and visually classified by EEI, both in the field and in the laboratory. Three (3) naturally occurring strata were characterized to exist at the investigated locations. A surface layer of asphalt was observed at each boring to depths 0.5 foot below existing grades.

Cross-sections of each boring, displaying the various strata, as well as other information obtained from the field investigation, are included within the Appendix on the Boring Profiles. The subsurface information is further detailed on the Boring Logs, which are also included in the Appendix.

EXISTING FILL

The soil designated as existing FILL materials was observed to be a mixture of light to dark brown sandy silt to orange-brown silty sand with varying amounts of gravel, brick fragments, and mica. The existing FILL materials were encountered beneath the asphalt. The FILL materials extended to depths ranging from 2.0 to 6.0 feet below existing grade.

The SPT values recorded during the sampling of the existing FILL ranged from 5 to 15 blows per foot of penetration. Based on these values, the relative density of the FILL material ranges from very loose to medium dense. These materials were encountered in a dry to moist state during the field investigation.

STRATUM I

The soil designated as Stratum I materials was observed to be a mixture of light brown-orange clayey silt, light brown with gray-brown silt, and red-brown clayey sand brown and gray-brown sandy silt to red-brown silty sand with varying amounts of trace gravel, and mica. The Stratum I materials were encountered beneath FILL or asphalt and extends downward to the Stratum II in nine (9) of the fourteen (14) test borings. Stratum I materials extended to depths ranging from 6.0 to 12.5 feet below existing grade. Based on laboratory classification the USCS Group Symbol for representative samples of this material is CL, and based on visual classification the material is also ML, and SC. The corresponding ASTM Group Name is Lean clay, and Clayey silt, Silt, and Clayey sand.

The SPT values recorded during the sampling of the Stratum I ranged from 4 to 23 blows per foot of penetration. Based on these values, the consistency of Stratum I material ranges from soft to very stiff. These materials were encountered in a moist state during the field investigation.



As determined by laboratory testing, the natural moisture contents range from 20.7 to 21.3 percent.

STRATUM II – DECOMPOSED SCHIST

The soil designated as Stratum II was observed to be light brown silty sand with gravel and mica, and gray-brown, mottled, micaceous, poorly graded sand with silt and gravel. Stratum II was encountered directly beneath the Stratum I except locations B-W1, B-E1, B-E3, B-S3 and B-S5 that it wasn't encountered at all. This stratum extends to depths ranging from 8.0 to 12.5 feet below existing grade. Based on visual and laboratory classification the USCS Group Symbol for representative samples of this material are SM, and SP-SM. The corresponding ASTM Group Name is Silty sand, and poorly graded sand with silt and gravel. Portions of this stratum were encountered in a saprolitic state. A saprolite is a soil which has undergone significant weathering, but still maintains its remnant foliation and mineral integrity.

The N-values recorded during the sampling of this material were ranged from 9 to greater than 50 blows per (1) foot of penetration. Based upon the N-values, as well as monitoring of the drilling rates, the relative density of this material is loose to very dense. Moisture level observations of this stratum ranged from dry to moist to wet. Confirmed by laboratory testing, the natural moisture content of Stratum II is 24.3 percent. Based on the action of the drill rig the drilling difficulty in Stratum II was medium to hard.

STRATUM III - WEATHERED SCHIST

The material designated as Stratum III is visually described as weathered schist in the form of dark brown to gray-orange micaceous silty sand with trace to some gravel. The assigned ASTM Group Names are silty sand with gravel. This Stratum is described as soils formed due to the fresh weathering of the underlying schist bedrock. Stratum III was observed beneath the Stratum II soils in six (6) of the fourteen (14) borings, and extended to the termination depths ranging from 11.5 to 15.0 feet below existing grade.

The N-values recorded during the sampling of this material ranged from 12 blows to greater than 50 blows per foot of penetration. Based upon the N-values, as well as monitoring of the drilling rates, the density of this material is medium dense to very dense. Moisture level observations of this stratum ranged from dry to moist. Confirmed by laboratory testing, the natural



moisture content of Stratum II is 17.2 percent. The degree of difficulty during the drilling within Stratum III ranged from hard to very hard and generally increased in difficulty with depth.

B. BEDROCK

Bedrock, defined herein by auger refusal within residual materials was encountered in all borings, at depths ranging from 11.0 feet to 15.0 feet, respectively. Auger refusal is typically interpreted as the drilling equipment encountering the moderately weathered to fresh bedrock surface.

TABLE II DEPTHS TO MEDIUM TO VERY DENSE WEATHERED ROCK AND BEDROCK					
Boring Location	1.) Ground Surface Elevation (feet)	2.) Approximate Depth to Dense to Very Dense Weathered Rock (feet)	Approximate Dense to Very Dense Weathered Rock Elevation (feet)	2.) Approximate Depth to Bedrock (Auger Refusal) (feet)	Approximate Bedrock Elevation (feet)
B-W1	42.0	12.0	30.0	13.5	28.5
B-W2	40.0	8.0	32.0	11.5	28.5
B-W3	40.0	9.0	31.0	12.0	28.0
B-W4	42.0	9.0	31.0	15.0	27.0
B-E1	42.0	10.0	32.0	13.2	28.8
B-E2	40.0	NE	NA	13.0	27.0
B-E3	40.0	NE	NA	12.0	28.0
B-E4	41.0	NE	NA	12.5	28.5
B-E5	40.0	NE	NA	11.0	29.0
B-S1	38.0	NE	NA	12.8	25.2
B-S2	38.0	NE	NA	12.5	25.5
B-S3	38.0	NE	NA	11.5	26.5
B-S4	38.0	NE	NA	12.5	25.5
B-S5	38.0	NE	NA	12.5	25.5

1.) Ground surface elevations were topographically estimated using the provided plans.

2.) Depths were measured from existing site grades at the time of the investigation.

3.) NE: Not Encountered; NA: Not Applicable

Further details regarding the bedrock and very dense weathered rock can be found in the *Excavation Methods* section of this report.

C. GROUNDWATER

Groundwater was encountered within three (3) of the fourteen (14) test boring locations. Groundwater initial and subsequent readings were encountered at depths ranging from 8.0 to



11.5 feet below existing grade. The depths and corresponding elevations at which the groundwater was observed are presented in the following table. It is believed these readings are due to perched water above the weathered rock layer. There were no subsequent groundwater readings due to the logistics of investigation.

TABLE I GROUNDWATER OBSERVATIONS					
Boring Location	^{1.)} Ground Surface Elevation (feet)	^{2.)} Initial Groundwater Depth (feet)	Initial Groundwater Elevation (feet)	^{2.)} Subsequent Groundwater Depth (feet)	Subsequent Groundwater Elevation (feet)
B-S1	38.0	8.0	30.0	NE	NA
B-W4	42.0	8.0	34.0	NE	NA
B-W1	42.0	11.5	30.5	NE	NA

^{1.)} Ground surface elevations based on topographic estimates as shown on provided plans.

^{2.)} Groundwater depths were measured from existing site grades at the time of the investigation.

^{3.)} NE: Not Encountered; NA: Not Applicable

It should be noted that groundwater table elevations may fluctuate with daily, seasonal, tidal and climatic variations. The contractor should be advised that they may conduct their own investigations to verify groundwater elevations prior to performing excavations on site.

IV. GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

EEI has completed a geotechnical analysis in order to provide foundation design recommendations. The analyses are based on the conditions encountered in the field, the laboratory analyses, and an estimated lowest level finished floor elevation of 40.0 to 38.0 feet specific to locations of each addition. Structural loads were provided to EEI from the project structural engineer the Joseph Barbato Associates (JBA). The maximum column loads for the proposed buildings in the order of 380 kips for additions A and C and 40 kips for additions D/E, and maximum wall loads on the order of 2 kips per linear foot for addition A, 4 kips per linear foot for addition C, and 2.5 kips per linear foot for additions D/E. In the event that the foundation loads exceed these values, EEI should be informed so that we can review and revise these recommendations, if necessary. EEI has evaluated the subsurface conditions and provides the following soil parameters utilized for foundation analyses in the following table.



TABLE III GEOTECHNICAL SOIL PROPERTIES				
Stratum	Existing FILL	Stratum I	Stratum II	Stratum III
Moist Unit Weight - γ_m (pcf)	115	110	125	130
Effective Stress Angle of Internal Friction - ϕ' (deg)	32	30	34	36
Cohesion - c (psf)	0	0	0	0

A. FOUNDATION RECOMMENDATIONS

Based on the results of the geotechnical subsurface investigations, the anticipated structural loads of the proposed development, laboratory analyses, and subsequent calculations, EEI recommends that the structure is supported by standard strip and spread footings at an allowable bearing pressure of 3,000 psf. At this bearing pressure, estimated total and differential settlements are expected to be less than 1.00 inch and 0.50 inch, respectively.

Foundations for the proposed additions, should bear at least 3 feet below lowest adjacent exterior grades in unheated areas. Interior foundations in heated areas should bear at least 2 feet below top of slab elevations. Based on these elevations, and difference in elevation across the three locations, the resultant bottom of footing elevation (BFE) is 37.0 for Additions D/E and C, and 35.0 for Additions A. At this assumed BFE, foundations will bear on Fill and Stratum I soils based on boring data. Loose Existing FILL and Stratum I materials may be encountered below the BFE, as evidenced in test borings B-W1, B-S3, B-S4, and B-S5. Prior to foundation construction, the bearing soils should be probed, proof rolled, or otherwise observed by an onsite representative of the Geotechnical Engineer. Any soils deemed unsuitable should be densified, removed, recompacted or replaced at the discretion of the onsite representative of the Geotechnical Engineer. In areas B-S3, B-S4, and B-S5, 4.0 – 5.0 feet of Existing Fill and soft Stratum I will need to be removed beneath the proposed foundations and replaced with compacted structural fill per FILL & Compaction section.

EEI provides the following recommendations to be used in foundation design for the proposed garage with single-story classroom. These recommendations are based on the assumption that recognized, proper construction practices will be followed throughout construction, and the Geotechnical Engineer of Record will oversee the inspection of site preparation, proof rolling, foundation construction, and other critical earthwork operations.



1. A shallow foundation system including strip and spread footings is recommended for support of the three one-story additions.
2. The base of all strip and spread foundations should be situated on suitably medium dense Stratum I, Stratum II, or Stratum III soils or properly-placed structural fill. Foundations should not bear on weak fill soils, frozen or saturated soils.
3. The foundations should be designed for a maximum allowable bearing capacity of 3,000 pounds per square foot (psf). Regardless of the load criteria, strip footings should be a minimum 18 inches wide and column footings should be a minimum of 36 inches wide for shear considerations.
4. Foundations may be designed for a bearing pressure of 3,000 psf at maximum column and wall loads of 380 kips and 4 kips per linear foot, respectively. After recommended improvements in areas of borings B-W1, B-S3, B-S4 and B-S5 total of differential settlements are estimated to be less than 1.0 inch to 0.5 inch, respectively.
5. The bottom of exterior foundations and foundations in unheated areas should be placed at least 36 inches below lowest adjacent exterior grades for protection from frost heave and 24 inches in heated areas.
6. The foundation subgrade (footing bottoms) should be compacted with hand-operated compaction equipment (i.e., a rammer or "jumping jack") or with a static mode, walk-behind, trench roller or a smooth roller (i.e., Rammax, Wacker, or Bomag equipment) in accordance with the Fill and Compaction section of this report.
7. All footing bottoms should be dry and completely cleaned of loose material or debris immediately before the placement of concrete.
8. The actual bearing conditions of the soil at the footing bottom elevation should be confirmed in the field during excavation, by inspection under the supervision of the Geotechnical Engineer of Record.
9. Every effort should be made to prevent water from entering open foundation excavations. Any water, which may accumulate in the bottoms of the excavation, should be removed immediately. It is recommended that following excavation and placement of concrete be performed on the same day and during fair weather conditions. Installation of the foundations should be carried out in accordance with applicable ACI guidelines, under the observation of a representative of EEI.

B. FLOOR SLABS

Floor slabs may be supported by approved subgrade soils and/or structural fill placed and compacted over approved subgrade soils in accordance with the *FILL AND COMPACTION* section of this report. Following completion of site preparation procedures, the proposed building pad area should be probed, proof-rolled or otherwise observed to densify and verify the integrity of the subgrade soils. It is critical that the proof rolling operation be performed in the presence of a representative of the Geotechnical Engineer of Record to ensure that the Fill, Stratum I, Stratum II and Stratum III materials are suitable to provide adequate slab support. Topsoil, if encountered, should be removed and replaced with controlled, compacted lifts of structural fill as outlined in the *FILL AND COMPACTION* section of this report. Any unstable zones of FILL, Stratum I and/or



Stratum II soils identified during proof-rolling operations can be aerated and dried in-place, if feasible. Alternately, EEI recommends localized over-excavation of any unstable materials to a firm and stable base and replacement with compacted structural fill as outlined in the *FILL AND COMPACTION* section of this report. The earthwork procedures described herein should be monitored and inspected by a representative of the Geotechnical Engineer of Record.

EEI recommends the floor slab for the proposed building be designed as a slab-on-grade system, and the subgrade should be prepared in accordance with the procedures described in this report. EEI recommends the placement of a granular subbase beneath the floor slab to provide uniform support distribution between the subgrade soils and the base of the concrete slab. Floor slabs supported on a minimum 6-inch thick layer of a clean stone, AASHTO #57 or equivalent, can be designed using a modulus of subgrade reaction of 125.0 psi/in provided that the soils are compacted to a minimum of 95% of the soils maximum dry density as determined by ASTM D 1557 (Modified) in fill areas. The floor slab should be suitably reinforced to control shrinkage cracks. Proper joints should be provided at the junction of the slab and foundation system so that a small amount of independent movement can occur without causing damage.

From a geotechnical perspective, a vapor retarder/barrier is not required to address any issues with moisture intrusion from shallow groundwater where the lower level is parking. Where there is ground level retail a vapor barrier may be considered. The need for a vapor retarder/barrier from a non-geotechnical perspective depends on the floor covering and/or humidity control in the proposed building space. Refer to appropriate documentation from the Portland Cement Association for guidance on the need and location of a vapor retarder/barrier. If a moisture sensitive floor covering is used, or the building space is equipped with humidity control, then a vapor retarder/barrier is recommended. Additionally, the location of the vapor retarder/barrier would depend on when slab construction is completed with respect to placement of a watertight roofing system. There is some debate in the industry on the use and location of vapor retarder/barrier. Regardless, these issues are not of a geotechnical nature. Therefore, EEI recommends that these issues be evaluated by the Architect and/or the project structural engineer accordingly to determine the need for, and location of the vapor retarder/barrier.

C. LATERAL EARTH PRESSURES

Subgrade structural elements that are restrained from deflection, such as basement walls, should be designed for the at-rest condition, K_0 . Subgrade structural elements that are free to deflect, such as retaining walls, should be designed for the active condition, K_a . The characteristics for the on-site subgrade materials are provided in the following table for use in



establishing the design of subgrade structural elements, as necessary. The coefficients presented in Table IV are based on assumptions of vertical structural elements, horizontal backfill and no wall friction. These values do not include a design safety factor. This information should only be used by design professionals with experience in this type of design, as certain soil parameters can vary depending on anticipated loading conditions. The design should incorporate anticipated surcharge loads from construction.

In accordance with the International Building Code (IBC 2009), Section 1805, below grade walls should at a minimum be damp-proofed. Damp-proofing materials for walls shall be installed on the exterior surface of the wall and shall extend from the top of the footing to above the ground level in accordance with IBC 2009, Section 1805.2.2.

TABLE IV				
PROPERTIES TO BE USED FOR THE COMPUTATION OF LATERAL LOADS				
STRATUM:	Existing FILL	Stratum I	Stratum II	Stratum III
Effective Angle of Internal Friction, ϕ' (deg)	32	30	34	36
Moist Unit Weight - γ_m (pcf)	115	110	125	130
Rankine Coefficient of Active Earth Pressure, K_a	0.31	0.33	0.28	0.26
Rankine Coefficient of Passive Earth Pressure, K_p	3.25	3.00	3.54	3.85
Rankine Coefficient of At-Rest Earth Pressure, K_o	0.47	0.50	0.44	0.41
Coefficient of Sliding, μ	0.44	0.40	0.47	0.51

D. SITE PREPARATION

EEl recommends that any existing utilities present to within 10-feet of the construction areas be relocated prior to the start of site preparation. Initial site preparation measures should include the complete removal of organics (including topsoil, mulch, root mass, wood, brush and trees), and any deleterious materials, extending a minimum distance of 10 feet beyond the proposed construction areas.

Existing underground piping and existing foundation elements, below existing grade within the development should be removed, or abandoned in place by filling with lean concrete or flowable fill. Existing foundation elements should be removed to a depth of at least two (2) feet below the affected, planned building foundation, utility or finished pavement grade. The



excavation to remove these utilities or existing foundations should be backfilled with structural fill as described in the FILL AND COMPACTION section of this report.

EEI recommends that the subgrade be proofrolled to densify and verify its stability prior to the placement of new foundations, concrete, drainage base stone, or structural fill. Proofrolling and compaction procedures are an integral part of the site preparation process necessary to densify and verify the integrity of the existing soils. EEI recommends that a smooth-drum vibratory roller having a minimum static-weight of 10 tons be used for proofrolling. Areas that cannot be accessed by this size of equipment should be densified and compacted by use of walk-behind or hand-operated equipment. The proofrolling and compaction activities should be overseen and evaluated during construction by the on-site representative of the Geotechnical Engineer of Record.

Loose Existing FILL and Stratum I materials were observed below the BFE in the area of test borings B-W1, B-S3, B-S4 and B-S5. These materials extend to 2.0 feet in B-W1, and 2.0, 4.0 to 6.0 feet in B-S3, B-S4, and B-S5. These are approximately to 1.0 feet, and 3.0 feet below the expected BFE in B-S3, and B-S5, respectively, B-W1 and B-S3 are above BFE and will be removed. These loose soils will require densification which should be done during the proof-rolling operation. Existing FILL and Stratum I materials, where encountered in the building foundation subgrade should be evaluated during site preparation by a representative of the Geotechnical Engineer of Record.

The site should be graded during construction to convey surface runoff away from active work areas. The work areas should be sealed by rolling on a daily basis to promote runoff. Careful grading and management of surface water runoff will help minimize disturbance of the subgrade. EEI recommends that all construction areas be proofrolled immediately before the placement of any structural fill and/or the placement of drainage base stone, and again before the installation of concrete or asphalt. Such preparations will allow soft and weak areas to be observed and remediated before construction.

E. EXCAVATION METHODS

Excavations will likely be within existing FILL, Stratum I or Stratum II soil based on proposed and existing grades. The existing FILL, Stratum I and Stratum II soils should be capable of being excavated with conventional earth excavation equipment and techniques. Although unlikely, Excavations that extend into the weathered rock of Stratum III may require the use of a late-model, high power track-hoe in lieu of a standard backhoe. EEI anticipates the Stratum III soil may become increasingly difficult and contingencies should be in place in order to facilitate a



rock removal method like hydraulic hammering or splitting (or other rock removal equipment and/or techniques).

Excavations must be sloped, benched, or shored to prevent collapse during excavation and construction. Sloping, benching, or shoring of all construction excavation should be conducted in accordance with 29 CFR 1926, Subpart P. A competent person, as defined by the aforementioned regulation, is required to confirm the stability of all excavations during construction. The actual excavation reinforcement should be determined in the field and should be based on the required depth of excavations and on the soil types encountered.

Excavations adjacent to existing structural elements should not undermine existing foundations, walls, slabs, driveways, or walkways. If excavations are required in the vicinity of these elements, EEI recommends that precautionary measures (i.e. underpinning or shoring) be implemented in the development scheme for this project. The recommendations outlined herein are provided for planning purposes only, and the contractor will remain the entity in "Responsible Charge" of all health and safety on the site. If underpinning or shoring is determined to be required, EEI should be contacted so that proper design of such measures may be formulated.

F. GROUNDWATER CONTROL

As previously referenced, static groundwater level was not observed at the elevation that would effect the development at the site. However, deeper excavations for utilities may encounter groundwater based on the elevations observed in the test borings. The contractor should be prepared to provide to adequate dewatering in order to maintain the groundwater levels below construction elevations. If groundwater infiltrates at the construction elevation, softening of the bearing surfaces will likely occur, and subgrade stabilization would be required. Therefore, the contractor should maintain the groundwater level approximately two (2) feet below the proposed excavation depth during construction until concrete has been placed and allowed to cure, and the area has been backfilled.

The primary system should be capable of dewatering the excavation continually during construction activities. A backup system should be available in the event that the primary system fails. It is recommended that the final selection of the dewatering system for this project be made by the successful contractor. Water produced during the dewatering operation should be handled in accordance with applicable statutes and regulations.

Construction during warm and dry summer months may reduce the scope of temporary groundwater control measures. The appropriate measures to be taken for groundwater control are the responsibilities of the contractor, and should be determined prior to construction and verified at the time of excavation. The contractor should be advised that additional investigations



can be conducted to gather more information regarding groundwater conditions to further evaluate the proposed construction methods and costs.

However, groundwater conditions may fluctuate with daily, seasonal and climatic events. Therefore, EEI recommends that is contacting with the geotechnical engineer in case of encountering the groundwater level during construction.

G. BASEMENT DAMPPROOFING

Based on the findings of the geotechnical investigation, hydrostatic pressures due to groundwater are not anticipated to develop adjacent to any subsurface walls or beneath slabs in the proposed construction area. Consequently, in accordance with the International Building Code (IBC 2018) Section 1805, below grade walls and floors should at a minimum be damp-proofed.

H. FILL AND COMPACTION

1. ON-SITE FILL CRITERIA

Fill material which supports foundations, floor slabs, pavements, and walkways, as well as fill for retaining walls and basin berms, is considered structural fill. Excavations required to achieve proposed grades may make Existing FILL, Stratum I, Stratum II and possibly Stratum III soils available for re-use as structural fill. Existing FILL is suitable for re-use if deleterious, non-inert materials are, removed prior to re-use. Stratum I soils may be difficult for re-use as structural fill due to their fine-grained matrix and high plasticity. They will require careful moisture control. Visual observations of Stratum III weathered rock indicate that these materials are suitable for use as structural fill. However, cobbles, boulders and rock fragments from weathered rock, and bedrock should be processed to less than 3 inches in size and mixed with suitable soil materials during placement to provide a well-graded structural fill. EEI recommends that all soil be further evaluated during site construction activities by the on-site Geotechnical Representative during the fill placement process.

If excessively moist portions of any of the strata are encountered during excavation, they will require time for aeration and drying to achieve the required densities and percentage compaction values for re-use as structural fill. Aeration and drying of excessively moist soil are best accomplished during warm dry summer months. The on-site soils will require careful moisture control as the majority contain finer-grained material that are sensitive to moisture changes. Caution should be exercised during construction to not stockpile and/or expose these soils to weather conditions for long periods of time. Materials stockpiled for use as structural fill should be graded to shed water and rolled to maintain the soils. During periods of wet site



conditions, travel upon the building pads and construction areas should be limited to minimize disturbance of the subgrade which will lead to instabilities.

2. IMPORTED FILL CRITERIA

If any general structural fill is required to be imported to the site, it should meet the following criteria:

- Granular soils such as GW, GP, GM SW, SP or SM as classified by ASTM D2487 are preferred, however soils having soil classifications GC, SC, ML or CL may be acceptable provided the Geotechnical Engineer of Record approves the soil;
- the largest particles within the fill should be no greater than 3 inches in diameter;
- not include deleterious materials such as construction debris, wood, glass, ash, trash, refuse, roots and other organic matter or contain frozen clumps of soil, snow or ice;
- have moisture contents within 3 percent of the soil's optimum moisture content and
- meets the definition of clean fill according to PADEP Management of Fill Policy, Document Number 258-2182-773.

The above criteria are provided as a general guideline for soil materials imported to the site. Soil materials that become available for use as a structural fill should be submitted to the Geotechnical Engineer of Record for evaluation before they are imported to the site.

3. COMPACTION CRITERIA

Structural fill should be placed in horizontal lifts not exceeding 8 inches in loose thickness and compacted with a smooth drum or sheep's foot vibratory roller with a minimum static weight of 10 tons. Structural fill should be placed in horizontal lifts of 6 inches loose thickness where compaction by hand-operated equipment is necessary. The optimum lift thickness and number of repetitions necessary to achieve the required percentage compaction values should be determined in the field with test passes of the chosen compaction equipment. Structural fill material should be placed at, or deviate nominally from, the optimum moisture content as determined in accordance with ASTM D698 (Standard Proctor) or ASTM D1557 (Modified Proctor) and compacted to a minimum of dry density as indicated in Table V.



TABLE V COMPACTION CRITERIA		
Fill Area	Percent of Maximum Dry Density ASTM D698 (Standard Proctor)	Percent of Maximum Dry Density ASTM D1557 (Modified Proctor)
Foundation Support, Slab-On-Grade	98	95
Pavements and Sidewalks	98	95
Basin Berms, Wall Backfill	98	95
Non-Structural	92	90

J. SEISMIC SITE CLASSIFICATION

According to the 2009 International Building Code (IBC Section 1615.1.1 Site Class Definitions) and the information obtained from the geotechnical field investigation, the average properties in the top 100 feet of soil/rock correspond to Site Class D Therefore, Site Class D conditions should be applied for the seismic design of the proposed building.

K. CONSTRUCTION QUALITY CONTROL

As documented within this report, the proposed construction will include significant earthwork procedures and foundation construction activities. It is the opinion of EEI that the quality of this work is an integral part of the development of this site and directly impacts the validity of the recommendations presented in this report. Based upon our past experience, the most effective and economical earthwork inspection is obtained through the presence of a qualified representative of the Geotechnical Engineer of Record during site preparation, proof rolling efforts, placement of structural fill, and installation of foundation elements. Therefore, we would recommend that these construction activities should be considered for monitoring and testing by EEI.

LIMITATIONS

The conclusions and recommendations presented in this report are based on assumptions regarding structural design and loads as stated herein. As the design progresses, EEI should be made aware if the stated assumptions deviate substantially from the final design, to provide an opportunity to revise the recommendations, if necessary.



The conclusions and recommendations presented in this report are based on assumptions regarding structural design and loads as stated herein. As the design progresses, EEI should be made aware if the stated assumptions deviate substantially from the final design, to provide an opportunity to revise the recommendations, if necessary.

This report has been prepared in order to assist the client for design of the proposed structure. Standard geotechnical practices were utilized in the subsurface investigation and development of this report. However, it must be noted that subsurface conditions may vary between testing locations. The recommendations presented herein do not address site elements such as any proposed utilities, stormwater structures, and pavement sections.

Unless specifically indicated to the contrary in this report, the scope of work for this report was limited only to the investigation and evaluation of the geotechnical aspects of the site conditions and does not include any considerations of potential site pollution, contamination, or other environmental issues. This report offers no opinions related to potential pollution or contamination of the site.

The procedures followed during the subsurface exploration, and the analyses and conclusions contained herein, have followed generally accepted practices of geotechnical engineering. EEI provides no other warranties, either expressed or implied, as to the professional advice provided under the terms of EEI's agreement and included in this report. The conclusions and recommendations presented in this report are based on the assumption that recognized proper construction practices will be followed throughout construction, and that a Professional Engineer qualified in Geotechnical Engineering, such as EEI, will be retained as the Geotechnical Engineer of Record to oversee the inspection of site preparation, proof rolling, foundation construction, and other critical earthwork operations. If subsurface conditions substantially deviate during construction from those described in this report, EEI should be contacted promptly.

EEI emphasizes that this geotechnical analysis was made for the construction of the single story additions to the existing building at 701 Henderson Blvd., Folcroft, Pennsylvania. EEI does not assume any responsibility for the use of this report in generating a foundation design for a site other than the one specifically addressed in this report or for any other purpose.





Respectfully submitted,
EARTH ENGINEERING INCORPORATED

A handwritten signature in black ink, appearing to read "B. Sibilla".

Benjamin P. Sibilla
Project Manager

A handwritten signature in black ink, appearing to read "Timothy B. Carlin".

Timothy B. Carlin, P.E.
Assistant Director – Geotechnical Investigations



APPENDIX
PLATE 1 - TOPOGRAPHIC MAP
PLATE 2 - GEOLOGIC MAP
BORING LOCATION PLAN
BORING PROFILES
BORING LOGS
LABORATORY TESTING RESULTS



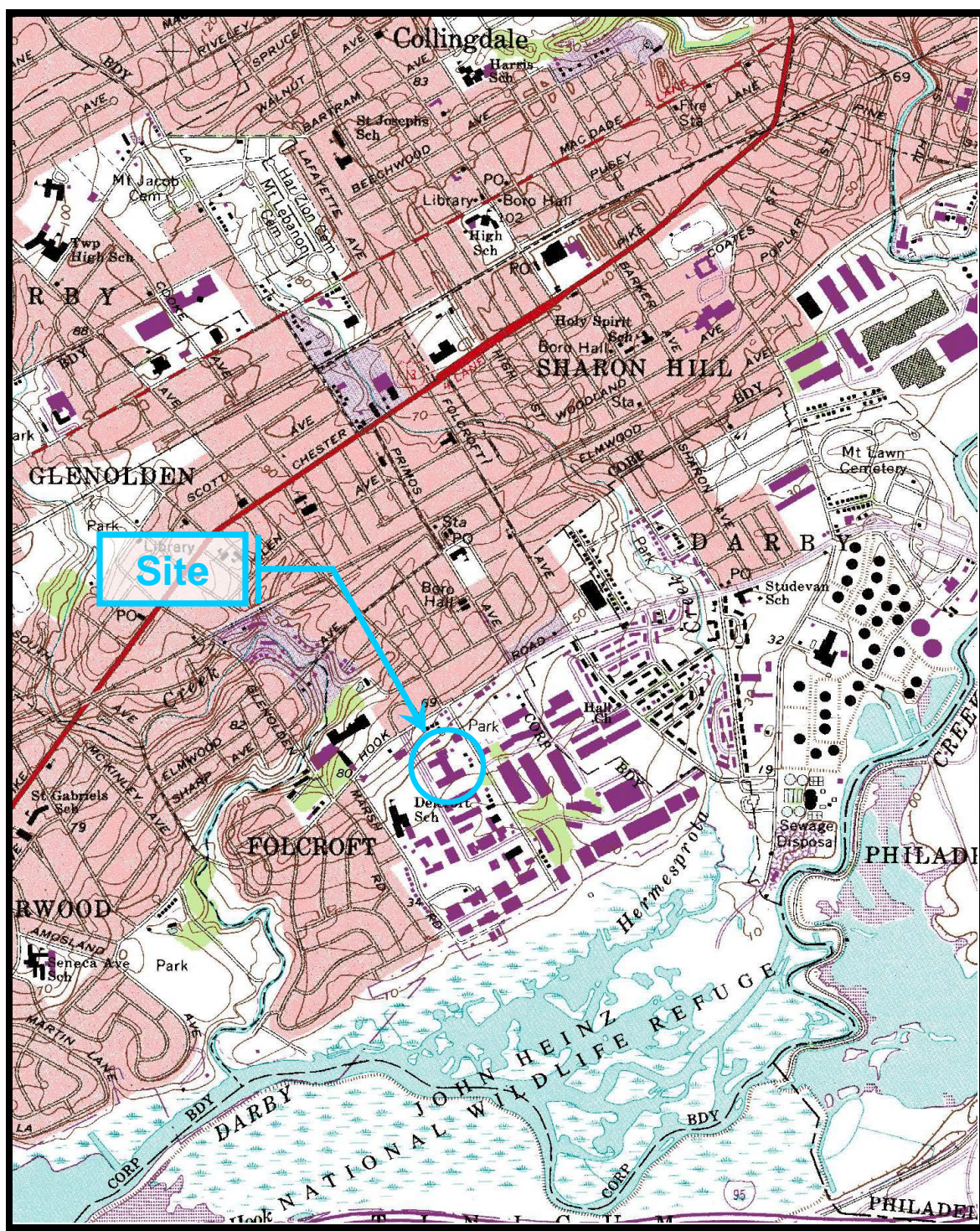


PLATE 1 – TOPOGRAPHIC MAP OF SITE

Reprinted from the United States Department of the Interior Geological Survey, Topographic Maps of Pennsylvania, Lansdowne, PA Quadrangle, Revised 1994.

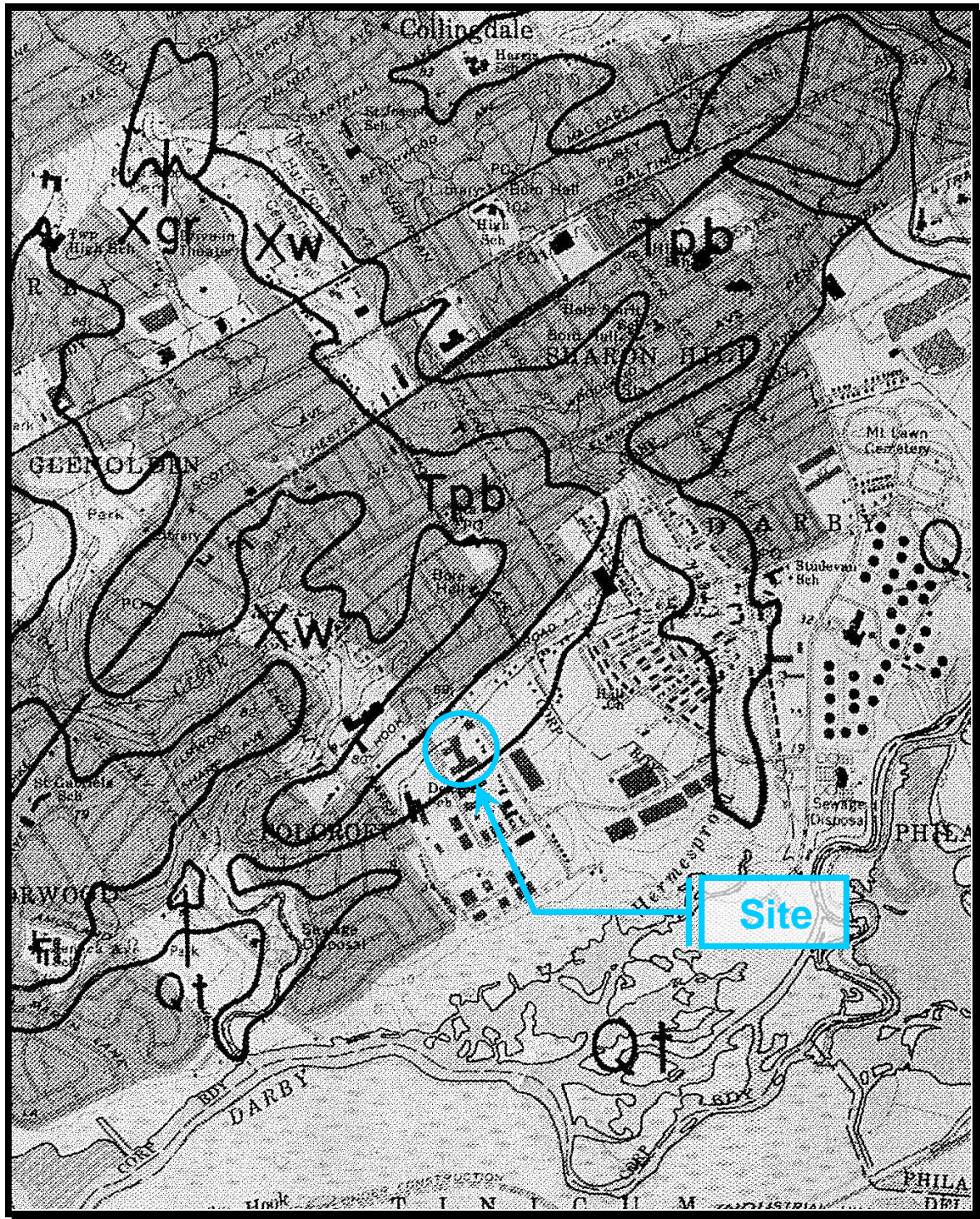
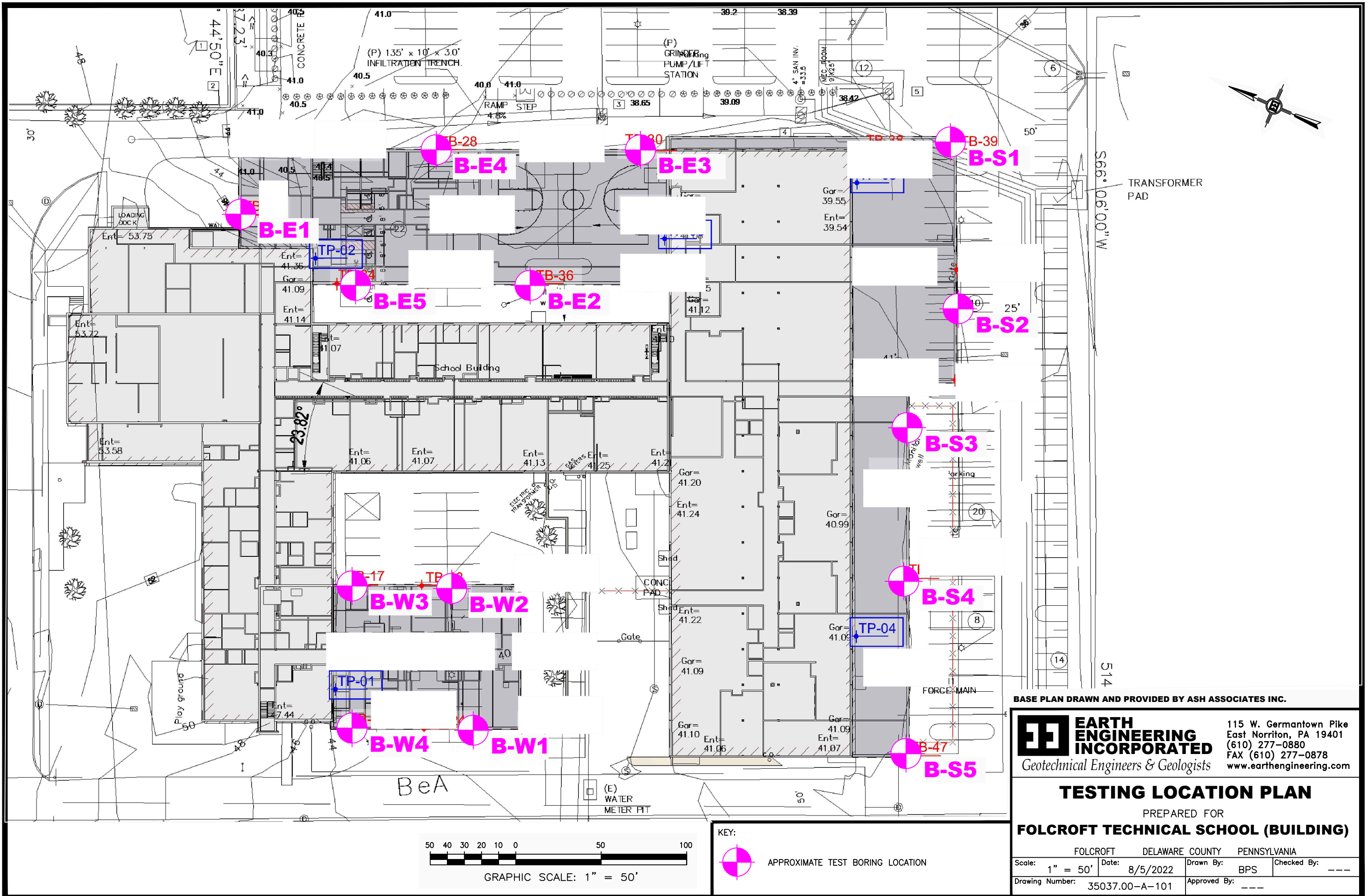
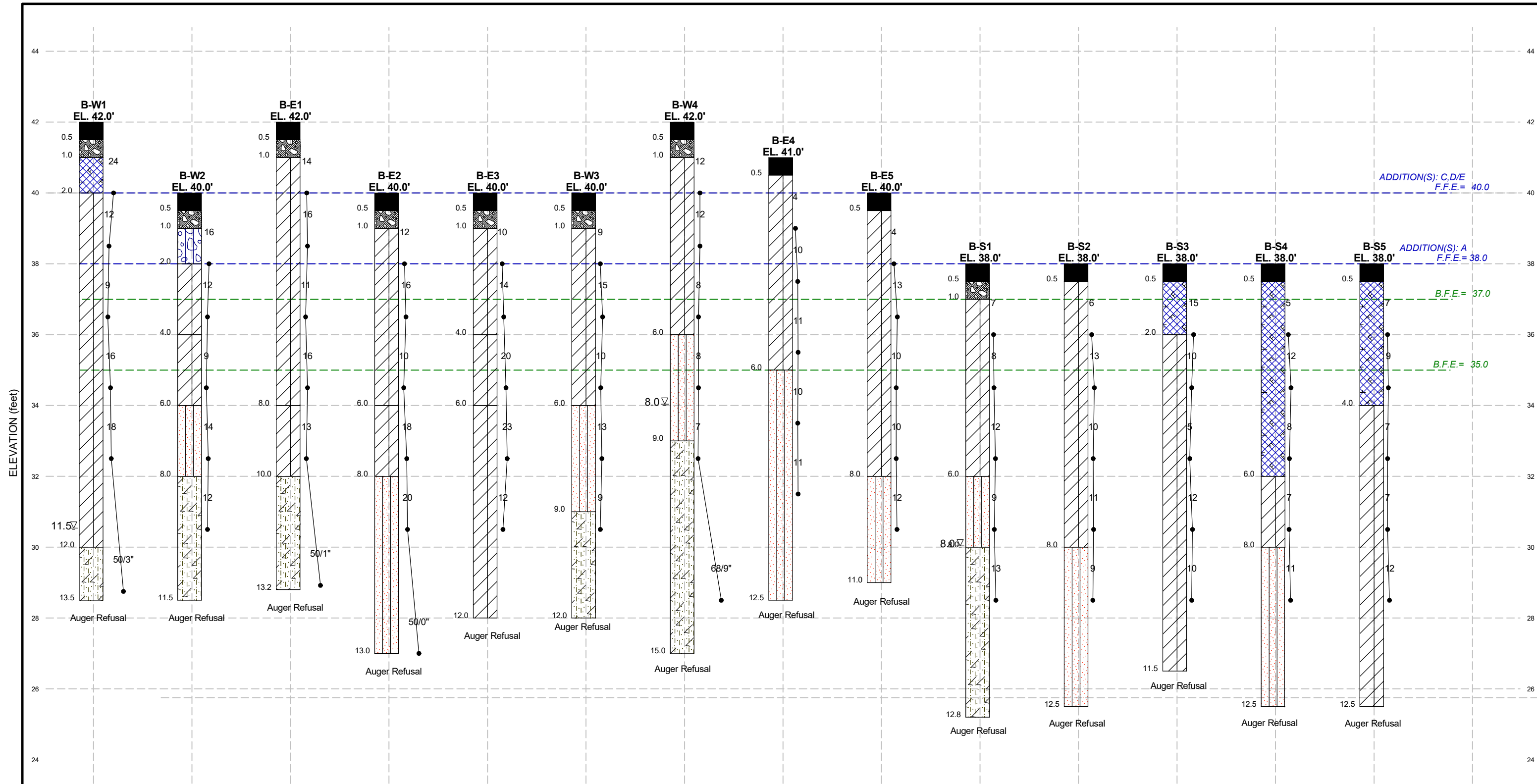





PLATE 2 - GEOLOGIC MAP OF SITE



Reprinted from the Pennsylvania Geological Survey, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania, Lansdowne, PA Quadrangle, 1978.





Lithology Graphics

- | | | | |
|---|---|---|--------------------------------|
|  | Asphalt |  | Stratum I - Clayey Silt |
|  | STONE AGGREGATE |  | Stratum II - Decomposed Schist |
|  | USCS Silty Gravel |  | Stratum III - Weathered Schist |
|  | FILL - Brown Sandy Silt with Rock Fragments | | |

-  Initial Groundwater Level
-  Subsequent Groundwater Level

F.F.E. = Finished Floor Elevation

B.F.E. = Proposed Footing Elevation



BORING PROFILES

PREPARED FOR

FOLCROFT TECHNICAL SCHOOL - DCIU

701 HENDERSON BLVD FOLCROFT PA

Project Number: 35037.00



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-E1
SHEET	1 OF 1
DATE: START	6/28/22
END	6/28/22
SURFACE ELEV. (FT)	42.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Dietrich D-50**

DRILLER NAME/COMPANY **Sean/Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5"**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **NE** TIME: **NA** DATE: **NA**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (FT.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DEPTH	ELEVATION	DESCRIPTION	REMARKS
0.5									0.5	41.5	Asphalt 6	
									1.0	41.0	Stone Base 6	
	S-1	7	1.0'	-	ML/CL	m					Clayey Silt to Sandy Clay, trace gravel, mottles; tan gray brown orange	0' - 8' Moderate Drilling
2.0		6										
	S-2	6	1.2'	-	ML/CL	m						
		8										
4.0		10										
	S-3	4	1.3'	-	ML/CL	m						
		5										
6.0		6										
	S-4	8	1.0'	-	ML/CL	m						
		8										
8.0		8							8.0	34.0		
	S-5	8	1.0'	-	CL	m					Clayey Silt to Lean Clay, trace gravel: gray brown	8' - 13.2' Dense Drilling
		7										
10.0		6							10.0	32.0		
		8									Silty Sand, little gravel and mica, saprolitic; brown gray orange (Weathered Schist)	
13.0												
13.1	S-6	50/1	0.1'	-	SM	m			13.2	28.8		Auger Refusal 13.2'




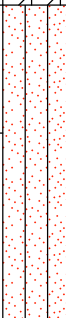
** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO. B-E2
SHEET 1 OF 1
DATE: START 6/28/22
END 6/28/22
SURFACE
ELEV. (FT) 40.0

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)		USCS	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	NOT ENCOUNTERED		REMARKS	
				RQD (%)						DEPTH	ELEVATION		
0.5										0.5	Asphalt 6	39.5	0' - 8' Moderate Drilling
	S-1	8 4 5	1.0'	-		ML/CL		m		1.0	Stone Base 6	39.0	
2.0													
	S-2	5 9 7 6	1.0'	-		ML/CL		m					
4.0													
	S-3	4 5 5 7	1.3'	-		ML/CL		m		6.0	Clayey Silt to Lean Clay; gray orange	34.0	8' - 13' Dense Drilling
6.0													
	S-4	9 9 9 10	1.3'	-		CL		m					
8.0										8.0	Silty Sand, little clay, little gravel, saprolitic; brown gray orange (Decomposed Schist)	32.0	
	S-5	10 10 10 9	1.0'	-		SM		m					
10.0													

** D = DRY, M = MOIST, W = WET



BORING NO.	B-E3
SHEET 1 OF 1	
DATE: START	6/28/22
END	6/28/22
SURFACE ELEV. (FT)	40.0

NOT ENCOUNTERED ☐

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO. B-E4
SHEET 1 OF 1
DATE: START 8/4/22
END 8/4/22
SURFACE
ELEV. (FT) 41.0

NOT ENCOUNTERED ☐[illegible]

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO. **B-E5**
SHEET **1** OF **1**
DATE: START **8/4/22**
END **8/4/22**
SURFACE
ELEV. (FT) **40.0**

NOT ENCOUNTERED ☐[illegible]

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO.	B-S1
SHEET 1 OF 1	
DATE: START	8/4/22
END	8/4/22
SURFACE ELEV. (FT)	38.0

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)		USCS AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DESCRIPTION		REMARKS	
				RQD (%)					DEPTH	ELEVATION		
0.0				-		NA			0.5	Asphalt (6")	37.5	Moderate Drilling, Moist from 0.0' to 12.8'
0.5									1.0	Stone Aggregate (6")	37.0	
	S-1	3 4	0.4'	-		D				Clayey Silt, some gravel, mica, mottling; Orange Brown		
2.0		3 3 5	1.0'	-		D						
	S-2	3 3 5 4	1.0'	-		D						
4.0		6 5 7	1.2'	-		M			6.0		32.0	Auger Refusal @ 12.8'
	S-3	6 5 7 6	1.2'	-		M						
6.0		8 4 5	1.3'	-		M			8.0	Silty Sand, little clay, trace gravel and mica; dark brown tan orange (Decomposed Schist)	30.0	
8.0		6 6 7 11	1.3'	-		M				Silty Sand, little gravel and mica, saprolitic; brown gray orange (Weathered Schist)		
10.0	S-5	6 6 7 11	1.3'	-		M						
									12.8		25.2	

** D = DRY, M = MOIST, W = WET



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-S2
SHEET	1 OF 1
DATE: START	8/5/22
END	8/5/22
SURFACE ELEV. (FT)	38.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Mobile B-57**

DRILLER NAME/COMPANY **Nick P./Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5"**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **NE** TIME: **NA** DATE: **NA**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0									DEPTH 0.5	ELEVATION 37.5
0.5				-			NA		Asphalt (6")	
1.0	S-1	3	1.0'	-			D		Clayey Silt to Silty Clay, trace to little gravel, mica, mottling; Gray Orange Brown	
2.0		3								
3.0	S-2	3	1.0'	-			D			
4.0		7								
5.0		6								
6.0	S-3	4	1.2'	-			D			
7.0		5								
8.0	S-4	6	1.3'	-			M			
9.0		6								
10.0	S-5	4	1.1'	-			M		Silty Sand, little clay, trace gravel and mica; dark brown tan orange (Decomposed Schist)	
11.0		5								
12.0		7								
12.5										Auger Refusal @ 12.5'
13.0										
14.0										
15.0										
16.0										
17.0										
18.0										
19.0										
20.0										
21.0										
22.0										
23.0										
24.0										
25.0										
26.0										
27.0										
28.0										
29.0										
30.0										
31.0										
32.0										
33.0										
34.0										
35.0										
36.0										
37.0										
38.0										

** D = DRY, M = MOIST, W = WET



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-S3
SHEET	1 OF 1
DATE: START	8/5/22
END	8/5/22
SURFACE ELEV. (FT)	38.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Mobile B-57**

DRILLER NAME/COMPANY **Nick P./Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5"**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **NE** TIME: **NA** DATE: **NA**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DEPTH	ELEVATION	DESCRIPTION	REMARKS
0.0				-			NA		0.5	37.5	Asphalt (6")	
0.5		5	1.0'	-			NA		2.0	36.0	Silty Sand with some gravel, trace brick; Orange Brown (FILL)	Moderate Drilling, moist from 0.0'- 11.5'
2.0	S-1	10	1.0'	-			NA					
		9										
	S-2	9	1.0'	-			NA				Clayey Silt to Silty Sand, trace gravel, organics, mottling, mica; Gray Orange	
		5										
		5										
4.0		5										
	S-3	1	1.2'	-			NA					
		2										
		3										
6.0		5										
	S-4	6	1.3'	-			NA					
		6										
		6										
8.0		7										
	S-5	6	1.0'	-			NA					
		5										
		5										
10.0		6										
									11.5	26.5		Auger Refusal @ 11.5'

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO.	B-S4
SHEET 1 OF 1	
DATE: START	8/5/22
END	8/5/22
SURFACE ELEV. (FT)	38.0

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%)		USCS	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DESCRIPTION		REMARKS			
				RQD (%)						DEPTH	ELEVATION				
0.0				-				NA		0.5	Asphalt (6")	37.5	Moderate Drilling, Moist from 0.0' - 12.5'		
0.5	S-1	2	0.5'	-			M		Sity Sand, some gravel, brick, wood; Dark Orange Brown (FILL)						
		3													
2.0		8													
	S-2	6	1.0'	-		M									
		7													
		5													
4.0		4													
	S-3	2	1.2'	-		M									
		4													
		4													
6.0		4													
	S-4	2	1.0'	-		M		Clayey Silt, trace gravel and sand, mottling; Gray Orange							
		2													
8.0		5													
	3														
	S-5	3	1.2'	-		M						Silty Sand, little clay, trace gravel and mica; dark brown tan orange (Decomposed Schist)			
		5													
10.0		6													
		7													
										12.5					25.5

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO. B-S5
SHEET 1 OF 1
DATE: START 8/5/22
END 8/5/22
SURFACE
ELEV. (FT) 38.0

NOT ENCOUNTERED ☐[illegible]

** D = DRY, M = MOIST, W = WET



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-W1
SHEET	1 OF 1
DATE: START	6/28/22
END	6/28/22
SURFACE ELEV. (FT)	42.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Dietrich D-50**

DRILLER NAME/COMPANY **Sean/Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5"**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **11.5'** TIME: **9:00am** DATE: **6/28/2022**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DEPTH	ELEVATION	DESCRIPTION	REMARKS
0.5									0.5	41.5	Asphalt 6	
									1.0	41.0	Stone Base 6	
	S-1	16 8 4	0.8'	-	GP	d					Silty Sand, little gravel; dark brown	0' - 10' Moderate Drilling
2.0									2.0	40.0	Clayey Silt to Sandy Clay, trace gravel, mottles; light grey orange	
	S-2	3 6 6	1.2'	-	ML/CL	m						
4.0												
	S-3	5 4 5	1.3'	-	ML/CL	m						
6.0												
	S-4	7 8 8	0.8'	-	ML/CL	m						
8.0												
	S-5	10 9 9	1.0'	-	ML/CL	m						
10.0												
												10' - 13.5' Dense Drilling
									12.0	30.0	Water @ 11.5'	
											Silty Sand, trace gravel, saprolitic; gray brown (Weathered Schist)	
13.0									13.5	28.5	Auger Refusal @ 13.5'	
13.3	S-6	50/3	0.2'	-	SM	m						

** D = DRY, M = MOIST, W = WET



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-W2
SHEET	1 OF 1
DATE: START	6/28/22
END	6/28/22
SURFACE ELEV. (FT)	40.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Dietrich D-50**

DRILLER NAME/COMPANY **Sean/Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5"**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **NE** TIME: **NA** DATE: **NA**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DEPTH	ELEVATION	DESCRIPTION	REMARKS
0.5									0.5	39.5	Asphalt 6	
									1.0	39.0	Stone Base 6	
	S-1	9 7	0.5'	-	GP	m					Gravelly Silt; gray	0' - 8' Moderate Drilling
2.0		7							2.0	38.0	No Recovery	
	S-2	4 6 6	0.0'	-		NA						
4.0		5							4.0	36.0		
	S-3	2 4 5	1.2'	-	ML/CL	m					Clayey Silt to Sandy Clay, trace gravel, frequent mica; gray brown orange	
6.0		5							6.0	34.0		
	S-4	5 7 7	1.0'	-	SM	m					Silty Sand, little clay, trace gravel and mica; dark brown tan orange (Decomposed Schist)	
8.0		7							8.0	32.0		
	S-5	5 5 7	1.0'	-	SM	m					Silty Sand, little gravel and mica, saprolitic; brown gray orange (Weathered Schist)	8' - 11.5' Dense Drilling
10.0		12										
									11.5	28.5		Auger Refusal @ 11.5'

** D = DRY, M = MOIST, W = WET



EARTH ENGINEERING INCORPORATED

Geotechnical Engineers & Geologists

BORING LOG

BORING NO.	B-W3
SHEET	1 OF 1
DATE: START	8/4/22
END	8/4/22
SURFACE ELEV. (FT)	40.0

PROJECT NAME **Folcroft Technical School - DCIU**

PROJECT LOCATION **701 Henderson Blvd Folcroft PA**

PROJECT NUMBER **35037.00**

INSPECTOR NAME **B. Sibilla**

EQUIPMENT USED **Mobile B-57**

DRILLER NAME/COMPANY **Nick P./Sano Drilling Inc.**

DRILLING METHODS **2" Split Spoon Sampling, Continuous to 10', Thereafter 5'**

AUGER: SIZE: **3.25 ID HSA** ; AUGER DEPTH: ; WATER: DEPTH: **NE** TIME: **NA** DATE: **NA**

CHECKED BY: **B. Yildiz** ; DATE: **8/25/2022** DEPTH: TIME: DATE:

NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (FT.)	RECOVERY (%)	USCS RQD (%)	AASHTO	H ₂ O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0									DEPTH ELEVATION	
0.5							NA		0.5 Asphalt (6") 39.5	
1.0	S-1	6	1.0'	-			D		1.0 Stone Aggregate (6") 39.0	Moderate Drilling, Moist
2.0		3							Clayey Silt to Silty Clay, trace sand, trace mica, mottling; Gray Orange Brown	
3.0	S-2	7	1.0'	-			M			Very Moist @ 3.0'
4.0		7								
5.0		8								
6.0	S-3	6	0.5'	-			M		6.0 34.0	
7.0		5								
8.0	S-4	6	1.0'	-			M		Silty Sand, little clay, trace gravel, mottling and mica; dark brown tan orange (Decomposed Schist)	
9.0		6								
10.0	S-5	4	1.0'	-			M		9.0 31.0	
11.0		5							Silty Sand, little gravel and mica, saprolitic; brown gray orange (Weathered Schist)	Moderate to Hard Drilling, Moist, Firm
12.0		17							12.0 28.0	Auger Refusal @ 12.0'

** D = DRY, M = MOIST, W = WET



BORING LOG

BORING NO. B-W4
SHEET 1 OF 1
DATE: START 8/4/22
END 8/4/22
SURFACE
ELEV. (FT) 42.0


NOT ENCOUNTERED ☐

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%)		USCS AASHTO	H ₂ O CONTENT	GRAPHIC LOG	NOT ENCOUNTERED		REMARKS	
				RQD (%)					DEPTH	ELEVATION		
0.0				-			NA		0.5	Asphalt (6")	41.5	Modertae Drilling, Dry
0.5									1.0	Stone Aggregate (6")	41.0	
	S-1	6	0.4'	-			D			Clayey Silt to Silty Clay, trace gravel and mica, mottling; Orange Gray Brown		
2.0		5										
	S-2	4 5 7	1.0'	-			D					
4.0		8										Moderate Drilling, Moist to Wet
	S-3	3 4 4	1.0'	-			D					
6.0		5							6.0		36.0	
	S-4	4 4 4 5	1.2'	-			M			Silty Sand, little clay, trace gravel and mica; dark brown tan orange (Decomposed Schist)		
8.0												
	S-5	4 4 3 6	1.2'	-			W		9.0		33.0	Wet @ 8.0'
10.0										Silty Sand, little gravel and mica, saprolitic; brown gray orange (Weathered Schist)		Auger Refusal @ 15.0'
12.0												
	S-6	10 18 50/3	1.0'	-			W					
14.3												
									15.0		27.0	

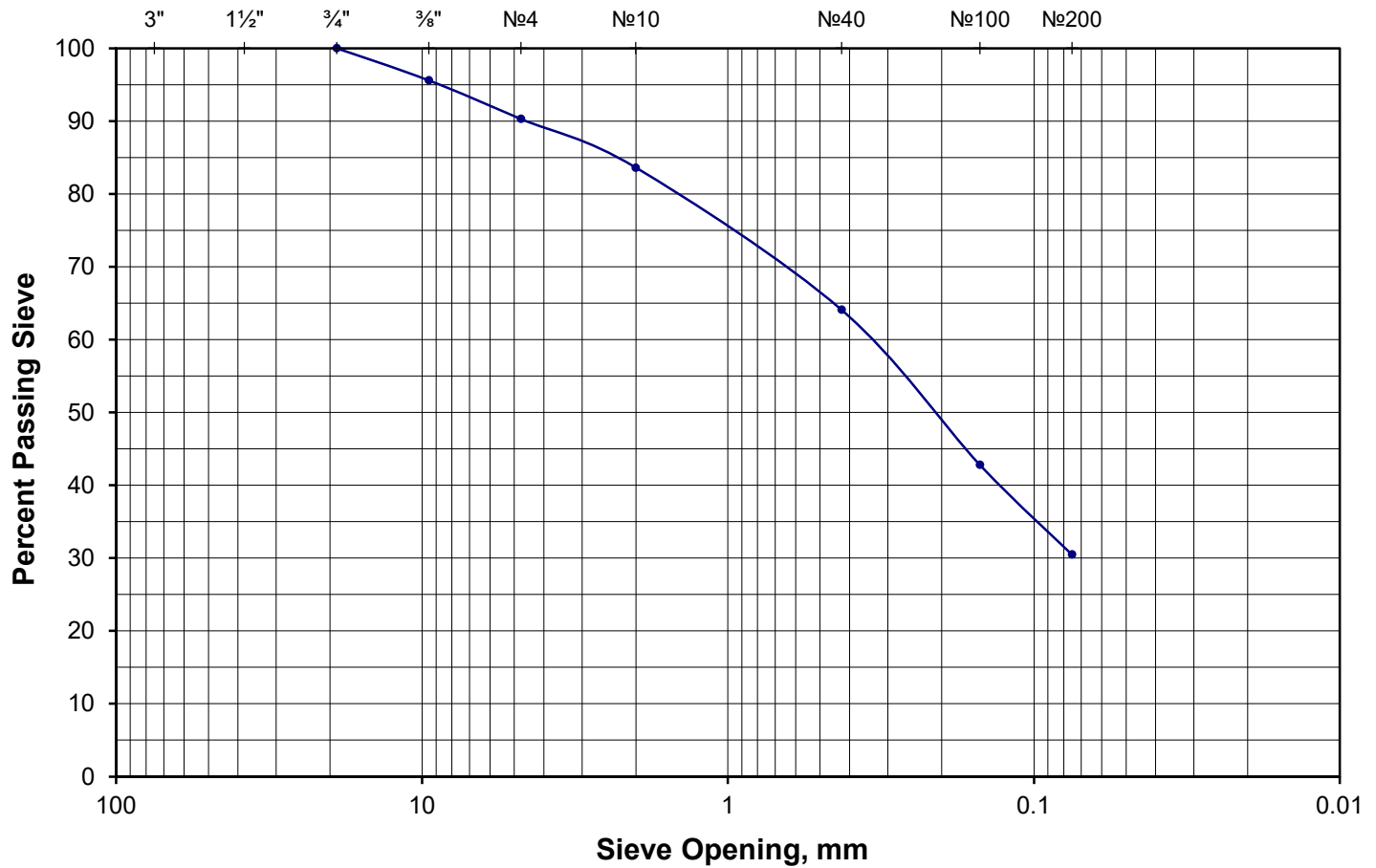
** D = DRY, M = MOIST, W = WET


Particle Size Analysis of Soils



As-rec'd water content: 21.3 moist Odor: NR				Particle Size								
% Gravel: 0.0		Coarse: 0.0		Fine: 0.0		US Standard Sieve Size		Diameter,	% Finer			
% Sand: 12.8		Coarse: 0.0		Medium: 2.4		Fine: 10.4		GRAVEL	Coarse	3"	75	
Gravel description:						1½"	38.1					
						¾"	19.0					
Sand description: orange-brown, subangular						Fine	⅜"		9.5			
							No 4		4.75			
Consistency: soft		Hardness: NR		SAND	Coarse	No 10	2.00	100.0				
Cementation: NR		Dry Strength: NR			Medium	No 40	0.425	97.6				
Structure: homogeneous		Dilatency: NR			Fine	No 100	0.150	90.2				
Reaction to HCl: NR		Toughness: NR				No 200	0.075	87.2				
USCS Classification: CL, lean clay				Hydrometer Analysis		Clay Size	0.005	NR				
AASHTO Classification: A-4						Colloids	0.001	NR				
				G _s : NR	C _u : N/A	C _c : N/A						
Project: 35037.01 - Folcroft Tech School Additions - DCIU - Inspection				LL: 30	PL: 20	PI: 10						
Client: Marotta Main Architects, Inc.				<div>EARTH ENGINEERING INCORPORATED</div> <div>Southern NJ 856-768-1001</div> <div>Central PA 717-697-5701</div> <div>Lehigh Valley 610-967-4540</div> <div>115 W Germantown Pk East Norriton, PA 19401 tel 610-277-0880 fax 610-277-0878</div>								
Sample: B-E4, S-2 (4-5-5-6) & B-S2, S-2 (3-7-6-8)												
Depth: 2.0'- 4.0'												
Description: Gray-brown lean clay												
Remarks:												
Classification of Soils, ASTM D 2487-17 / D 2488-09a												
August 17, 2022												


Particle Size Analysis of Soils



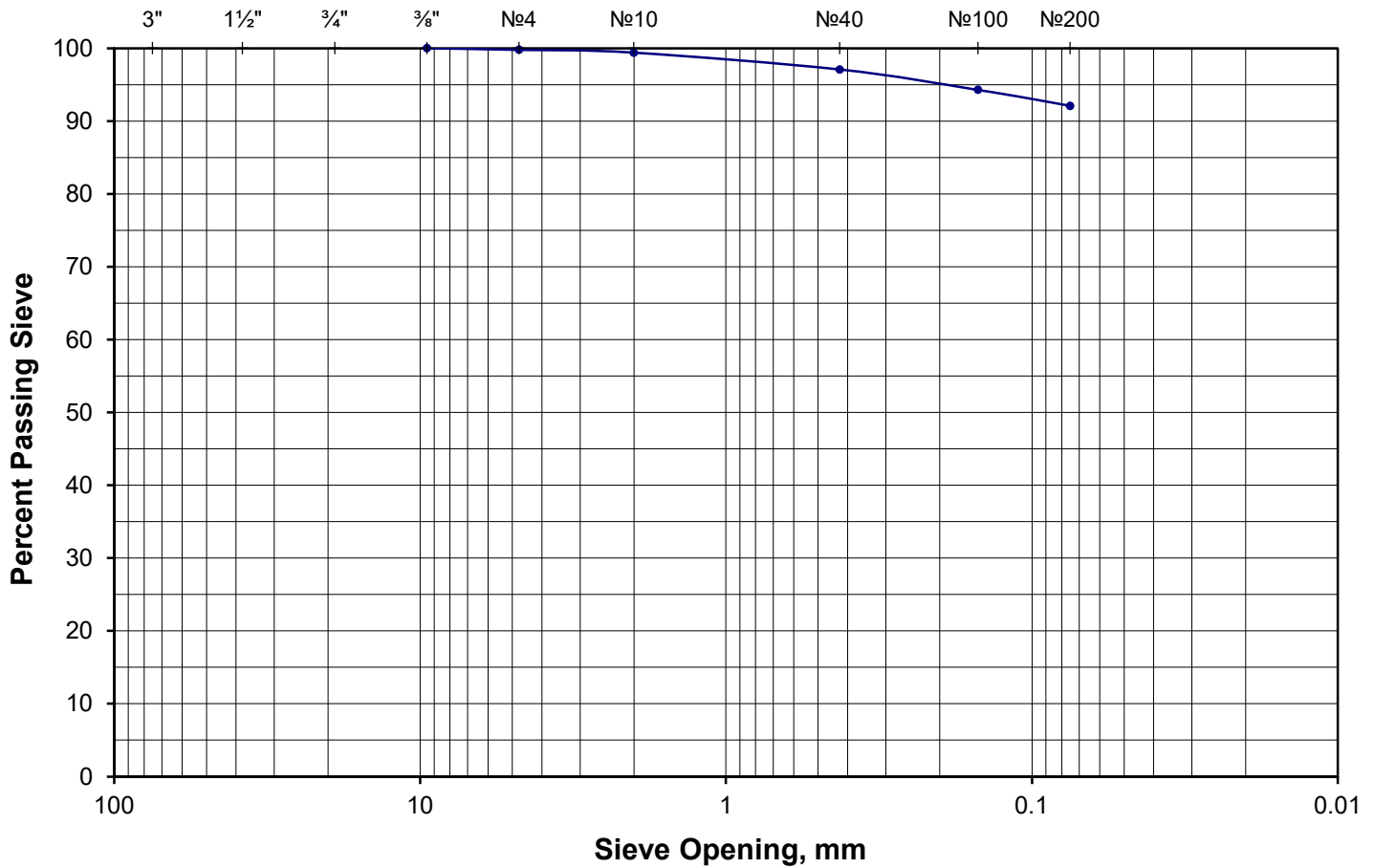
As-rec'd water content: 17.2 wet Odor: NR				Particle Size								
% Gravel: 9.7		Coarse: 0.0		Fine: 9.7		US Standard Sieve Size		Diameter,	% Finer			
% Sand: 59.8		Coarse: 6.7		Medium: 19.5		Fine: 33.6		GRAVEL	Coarse	3"	75	
Gravel description: brown,with mica, subangular						1½"	38.1					
						¾"	19.0			100.0		
Sand description: brown, micaceous, subangular						Fine	⅜"		9.5	95.6		
							No 4		4.75	90.3		
Consistency: firm		Hardness: NR		SAND	Coarse	No 10	2.00	83.6				
Cementation: NR		Dry Strength: NR				Medium	No 40	0.425	64.1			
Structure: homogeneous		Dilatancy: NR			Fine	No 100	0.150	42.8				
Reaction to HCl: NR		Toughness: NR				No 200	0.075	30.5				
USCS Classification: SM, silty sand						Hydrometer Analysis		Clay Size	0.005	NR		
AASHTO Classification: A-2-4								Colloids	0.001	NR		
						G _s : NR	C _u : N/A	C _c : N/A				
Project: 35037.01 - Folcroft Tech School Additions - DCIU - Inspection						LL: NP	PL: NP	PI: NP				
Client: Marotta Main Architects, Inc.						<div></div> <div>EARTH ENGINEERING INCORPORATED</div> <div>Southern NJ 856-768-1001</div> <div>Central PA 717-697-5701</div> <div>Lehigh Valley 610-967-4540</div> <div>115 W Germantown Pk East Norriton, PA 19401 tel 610-277-0880 fax 610-277-0878</div> <div>Geotechnical Engineers & Geologists</div>						
Sample: B-S1, S-5 (6-6-7-11) & B-E4, S-5 (5-5-6-5)												
Depth: 8.0'- 10.0'												
Description: Brown to orange-brown silty sand												
Remarks:												
Classification of Soils, ASTM D 2487-17 / D 2488-09a												
August 17, 2022												


Particle Size Analysis of Soils



As-rec'd water content: 24.3 wet Odor: NR			Particle Size				
% Gravel: 1.5	Coarse: 0.0	Fine: 1.5	US Standard Sieve Size		Diameter, % Finer		
% Sand: 61.4	Coarse: 1.4	Medium: 8.1 Fine: 51.9	GRAVEL	Coarse	3"	75	
Gravel description: brown to light brown, subangular to subrounded					1½"	38.1	
					¾"	19.0	100.0
Sand description: brown to light brown, micaceous, subangular to subrounded				Fine	⅜"	9.5	99.2
			No 4		4.75	98.5	
Consistency: firm	Hardness: NR		SAND	Coarse	No 10	2.00	97.1
Cementation: NR	Dry Strength: NR			Medium	No 40	0.425	89.0
Structure: homogeneous	Dilatency: NR			Fine	No 100	0.150	65.1
Reaction to HCl: NR	Toughness: NR				No 200	0.075	37.1
USCS Classification: SM, silty sand			Hydrometer Analysis		Clay Size	0.005	NR
AASHTO Classification: A-4					Colloids	0.001	NR
			G _s : NR	C _u : N/A	C _c : N/A		
Project: 35037.01 - Folcroft Tech School Additions - DCIU - Inspection			LL: NP	PL: NP	PI: NP		
Client: Marotta Main Architects, Inc.			<div><div></div><div><div>EARTH ENGINEERING INCORPORATED</div><div>Southern NJ 856-768-1001</div><div>Central PA 717-697-5701</div><div>Lehigh Valley 610-967-4540</div></div></div> <div><i>Geotechnical Engineers & Geologists</i></div> <div>115 W Germantown Pk East Norriton, PA 19401 tel 610-277-0880 fax 610-277-0878</div>				
Sample: B-S2, S-5 (6-4-5-7) & B-W4, S-5 (4-4-3-6)							
Depth: 8.0'- 10.0'							
Description: Brown silty sand							
Remarks:							
Classification of Soils, ASTM D 2487-17 / D 2488-09a				August 17, 2022			

Particle Size Analysis of Soils



As-rec'd water content: 20.7 moist Odor: NR			Particle Size				
% Gravel: 0.2 Coarse: 0.0 Fine: 0.2		US Standard Sieve Size		Diameter,	% Finer		
% Sand: 7.7 Coarse: 0.4 Medium: 2.3 Fine: 5.0		GRAVEL	Coarse	3"	75		
Gravel description: orange-brown, subangular				1½"	38.1		
				¾"	19.0		
Sand description: orange-brown, micaceous, subangular			Fine	⅜"	9.5	100.0	
				No 4	4.75	99.8	
Consistency: firm Hardness: NR		SAND	Coarse	No 10	2.00	99.4	
Cementation: NR Dry Strength: NR			Medium	No 40	0.425	97.1	
Structure: homogeneous Dilatency: NR			Fine	No 100	0.150	94.3	
Reaction to HCl: NR Toughness: NR				No 200	0.075	92.1	
USCS Classification: ML, silt			Hydrometer Analysis		Clay Size	0.005	NR
AASHTO Classification: A-4					Colloids	0.001	NR
			G _s : NR	C _u : N/A	C _c : N/A		
Project: 35037.01 - Folcroft Tech School Additions - DCIU - Inspection			LL: NP	PL: NP	PI: NP		
Client: Marotta Main Architects, Inc.			<div><div></div><div><div>EARTH ENGINEERING INCORPORATED</div><div>Southern NJ 856-768-1001</div><div>Central PA 717-697-5701</div><div>Lehigh Valley 610-967-4540</div></div></div> <div><div>Geotechnical Engineers & Geologists</div><div>115 W Germantown Pk East Norriton, PA 19401 tel 610-277-0880 fax 610-277-0878</div></div>				
Sample: B-W4, S-3 (3-4-4-5) & B-E4, S-3 (3-5-6-6)							
Depth: 4.0'- 6.0'							
Description: Gray to orange-brown silt							
Remarks:							
Classification of Soils, ASTM D 2487-17 / D 2488-09a				August 17, 2022			