MUHLENBERG TOWNSHIP
BERKS COUNTY, PENNSYLVANIA

PUBLIC WORKS BUILDING

CONTRACT A	-	**GENERAL SITE/BUILDING**
CONTRACT B	-	**HVAC**
CONTRACT C	-	**PLUMBING**
CONTRACT D	-	**ELECTRICAL**

NOVEMBER 18, 2019
ADDENDUM NO. 1

Each Bidder shall take note of the following additions/changes, revisions, or clarifications of the Bid Documents for the above referenced project, and shall bid accordingly. The Bid Date has not been changed. Bids will be received until 1:00 P.M. prevailing time on December 9, 2019 as indicated on the Advertisement for Bids. Also each Bidder shall further acknowledge their receipt of Addendum No. 1 prior to bidding by listing "Addendum No. 1 and Date Received" on the space provided on Page 2 "Bid Form".

- **CHANGES/REVISIONS:**

1. **INDEX**

A. **Remove and Destroy**: Index Page 6 of 6 in its entirety from the bid documents.

Insert: The enclosed **revised** Index Pages 6 of 6 marked "***Revised Addendum No. 1 November 18, 2019***".

Note: Prevailing Wages are included to be inserted into Appendix "C" and Appendix "G" (Geotechnical/Foundation Report prepared by Earth Engineering, Inc., dated June 21, 2019) was added to the Appendices.

- **ADDITIONS**:

1. APPENDICES

A. Add: Attached is a copy of the prevailing wages for Appendix "C" - Pennsylvania Wage Rate Determination.

B. Add: Attached is a copy of the Geotechnical/Foundation Report prepared by Earth Engineering, Inc. dated June 21, 2019 for Appendix "G."

Sincerely,
Systems Design Engineering, Inc.

Michael W. "Chip" Pohronezny

Attachments

DIVISION 26 – ELECTRICAL CONT'D.

265119 LED Interior Lighting
265600 Exterior Lighting

DIVISION 27 – COMMUNICATIONS

271500 Communication Cabling System

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

283111 Digital, Addressable Fire Alarm System

DRAWINGS (Attached Separately)

APPENDICES

APPENDIX "A" Affidavit of Release of Liens and Final Waiver of Liens (Forms and Sample Forms)
APPENDIX "B" Consent of Surety to Final Payment
APPENDIX "C" Pennsylvania Wage Rate Determination
APPENDIX "D" Non-discrimination/Sexual Harassment Clause
APPENDIX "E" Erosion & Sediment Control Plan Narrative
APPENDIX "F" HOP Permit (Application)
APPENDIX "G" Geotechnical/Foundation Report prepared by Earth Engineering, Inc., dated June 21, 2019

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

FOUNDATION REPORT

PROPOSED MAINTENANCE GARAGE

FOR

MUHLENBERG TOWNSHIP

LEESPORT AVENUE

MUHLENBERG TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

Prepared For:

Systems Design Engineering, Incorporated
1032 James Drive
Leesport, Pennsylvania 19533

EEI Project Number: 31831.00

June 21, 2019

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I. PROJECT OBJECTIVE AND SCOPE OF WORK

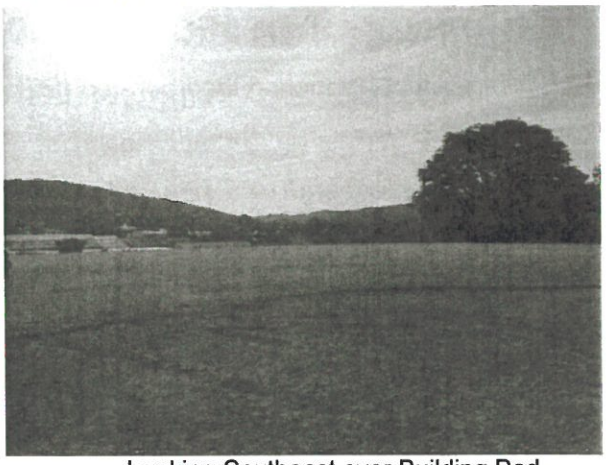
Earth Engineering Incorporated (EEI) completed the Foundation Report for the proposed maintenance garage for the Municipality of Muhlenberg Township to be located along Leesport Avenue in Muhlenberg Township, Berks County, Pennsylvania. The objective of this project was to investigate, document, and analyze the subsurface conditions present within the footprint of the proposed structure. Based upon the subsurface conditions, recommendations regarding the design of a foundation system for the proposed structure, as well as general earthwork and construction recommendations, were developed and are included within this Report.

The scope of work for this project included a field investigation, a geologic analysis of site conditions, laboratory testing of a soil sample obtained during the field investigation, and a geotechnical engineering analysis. The work was performed in accordance with EEI proposal LV4959, dated June 3, 2019. This Report presents the results of our work.

II. SITE DESCRIPTIONS

The site is located along Leesport Avenue in Muhlenberg Township, Berks County, Pennsylvania. The site is bordered by Leesport Avenue and existing township buildings to the east, agricultural fields and an electrical substation to the north, residential properties to the west, and commercial properties to the south. Currently, the site is grass covered with athletic fields and courts, and a playground. An existing structure occupies the northwestern corner of the property. The overall topography of the site is relatively flat, sloping gently downward to the north and northeast. Based on the surface elevation of the borings, the maximum relief across the site is approximately three and one half feet (3.5'). Plate 1, included in the Appendix of this Report, shows the general location of the site on a topographic map of the area. The following photographs show the site conditions at the time of the field investigation:

Looking West over Southern Portion of Building Pad And B-105 (Photograph 1)

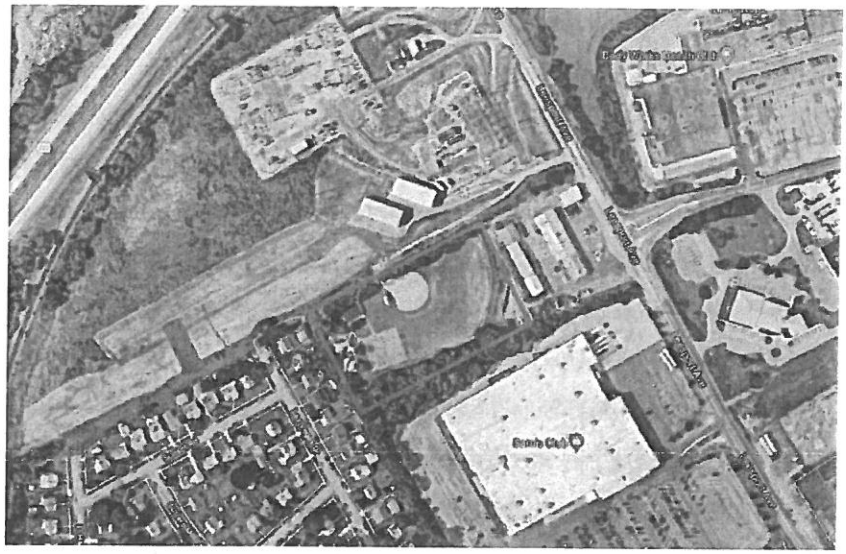


Looking Southeast over Building Pad (Photograph 2)

Looking Southwest over of Building Pad (Photograph 3)

Looking West over Building Pad (Photograph 4)

The following aerial photograph from Google Maps; Satellite View, shows the features and conditions of the entire site:



III. PROJECT DESCRIPTIONS

According to the draft *Overall Plan*, undated, prepared by System Design Engineering, Incorporated (SDEI) and provided to EEI via email, the proposed construction consists of a 27,100 square foot (sf) maintenance garage facility, having a finished floor elevation of 383.5 feet. At the time of report preparation, the anticipated column and wall loads were not available. Based on past experience with similar retail stores, EEI estimated the maximum column loads will not exceed 100 kips, nor will the wall loads exceed 3 kips per linear foot (klf). The proposed construction, in relation to the existing site features, is shown on the *Boring Location Plan*, EEI Drawing Number: 31831.00-A-101, which is included in the Appendix of this Report.

IV. FIELD INVESTIGATION

Six (6) borings, designated as B-101 through B-106, were conducted for this investigation. The borings were performed on June 12, 2019, by Main Line Drilling Company of Wayne, Pennsylvania. Supervision and monitoring of the boring program were performed by a representative of EEI. The boring locations were field determined by representatives of EEI based on the provided plans. The surface elevations for these borings were determined by utilizing the pitching rubber on the baseball field as a reference datum. Based on conversations with SDEI, the pitching rubber elevation was 384.94 feet. The location of each test boring is shown on the *Boring Location Plan*, which is included in the Appendix.

The test borings were advanced using two inch (2") outer diameter (O.D.) split barrel samplers, and six inch (6") O.D. hollow stem augers. Split-barrel samples, conducted in accordance with American Society for Testing and Materials (ASTM) standard D1586, were taken at regular intervals throughout the depths of all the borings. 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 two inch (2") O.D. split-barrel sampler six inches (6") using a one hundred forty pound (140#) weight dropped thirty inches (30"). The number of blows required to advance the sampler over the 12 inch interval from 6 to 18 inches is considered the "N" value. The test boring logs, which provide sample depths, description of the materials encountered and sampling data, are included in the Appendix of this Report. The information presented on these logs was used to generate boring profiles that graphically represent the subsurface conditions encountered at the boring locations. The *Boring Profiles*, EEI Drawing Sheet Number: 31831.00-A-102 are also included within the Appendix of this Report.

The borings were conducted to depths ranging from 6.0 to 20.0 feet below the existing ground surface. Auger refusal was encountered at four (4) boring locations at depths ranging from 6.0 to 18.0 feet below the existing ground surface. Auger refusal is typically interpreted as the drilling apparatus encountering the bedrock surface. Sample barrel refusal terminated boring location B-101 at a depth of 18.7 feet below the existing ground surface. Sample barrel refusal is typically interpreted as the sample barrel encountering very dense soils conditions and/or weathered rock. Sample barrel refusal can also be an indication of encountering the bedrock surface. Hard augering, which indicates very dense soils conditions and/or weathered rock, was encountered at five (5) boring locations at depths ranging from 4.0 to 16.0 feet below the existing ground surface. It should be noted that hard augering on pinnacled rock was encountered at boring location B-101 at depths between 10.5 to 12.0 feet below the existing ground surface. Intermittent augering, between easy and hard, was encountered at boring location B-104 between depths of 6.5 to 18.5 feet below the existing ground surface. This can occur within a pinnacled rock subsurface topography. Finally, groundwater was not encountered within any of the boring locations conducted, to the depths achieved. The total depth of each boring location and the conditions encountered can be observed on the *Boring Logs* and the *Boring Profiles,* included in the Appendix of this Report.

V. LABORATORY TESTING

One (1) representative soil sample recovered during this subsurface investigation was tested in the laboratory. The laboratory testing conducted on this sample consisted of classification, in accordance with ASTM D2487, to verify visual classifications and to establish engineering parameters required for analysis. The tests performed include: Particle Size Analysis (ASTM D422), Atterberg Limits Determination (ASTM D4318), and Natural Moisture Content (ASTM D2216). A Unified Soil Classification System (USCS) Group Symbol and ASTM Group Name were assigned to the soil based upon the laboratory testing. The results of the laboratory testing conducted are presented in Table I. A gradation curve, numerically and graphically depicting the results of the analyses, is presented in the Appendix.

TABLE I
LABORATORY TESTING RESULTS

Sample Location	B-105
Sample Number	S-3, S-4
Sample Depths, ft.	4.0'-8.0'
Stratum	I
Atterberg Limits	
Liquid Limit	NP
Plastic Limit	NP
Plasticity Index	NP
Natural Moisture Content (%)	20.8
Unified Soil Classification System (USCS) Group Symbol	SM
ASTM Group Name	Silty Sand with Gravel

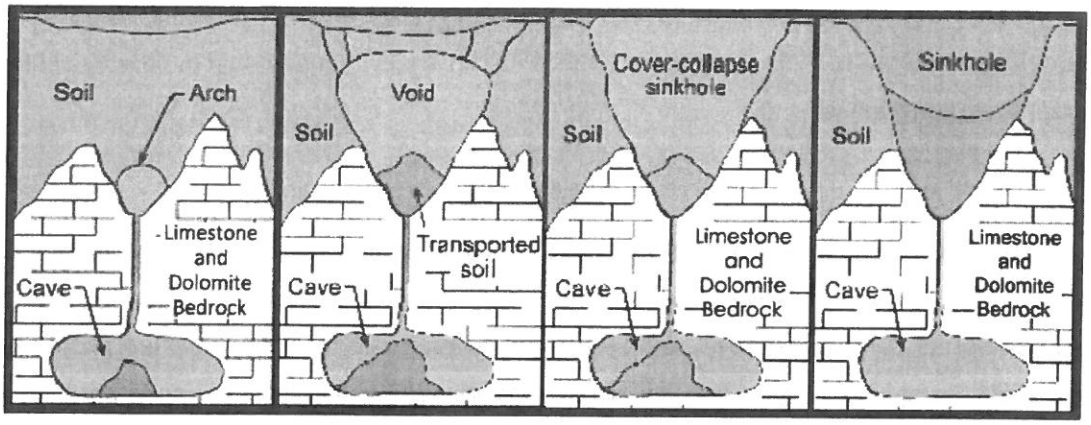
VI. SUBSURFACE CONDITIONS

A). GEOLOGY

According to the Commonwealth of Pennsylvania, Department of Conservation and Natural Resources, *PA DCNR Interactive Map*, reprinted June 10, 2019, the site is underlain by the Cambrian Period Leithsville Formation (Geologic Symbol: Clv). 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, Topographical and Geologic Survey, *Engineering Characteristics of the Rocks of Pennsylvania,* Fourth (4th) series, revised 1982, this formation is composed of a dark-gray to medium-gray dolomite; some calcareous shale and sandy dolomite. Minerals typically associated with this rock type include quartz, limestone and sandstone. The bedding of this rock type is moderately well bedded with joints having a blocky pattern. This rock type is characteristically slightly to moderately weathered, resulting in a relatively thin overlying soil mantle. Good surface drainage and little subsurface drainage are characteristic of landscapes underlain by the Leithsville Formation. The excavation of this material is considered difficult in comparison to other rock types, due to the presence of bedrock pinnacles.

It is noted that the dolomite of the Leithsville Formation are carbonate rocks. Having a carbonate structure, limestone and dolomite are subject to openings and the development of sinkholes. Carbonate rock is susceptible to dissolution when exposed to water, particularly slightly acidic water. This weathering process leaves voids in the parent bedrock. Some features commonly associated with carbonate geology are very soft and moist soil conditions, sinkholes, and voids within the bedrock. The past dissolutions of carbonate rock, not future dissolution, are the greater hazard for site development. In most cases, previous dissolution of carbonate bedrock allowed the development of cracks and caves within the bedrock: similar to a network of plumbing pipes. If water can flow into these "pipes", it will transport some of the overburden soil with it. As more and more soils are washed into the voids within the bedrock, the ground surface may become depressed, or collapse altogether, forming a sinkhole. Plate 3, included with this Report, shows the location of the site on a sinkhole and karst related features plan. The following diagram obtained from the Kentucky Geological Survey, depicts the typical stages of sinkhole development/collapse:



Based upon the soil samples and rock fragments recovered from the field investigation, this site is underlain by residual soils and dolomite of the Leithsville Formation.

B). SOIL / BEDROCK

The soil and weathered rock samples obtained during the field investigation were examined and visually classified by EEI, both in the field and in the laboratory. Based upon the classifications and the laboratory testing conducted, a generalized subsurface profile was developed for this site. One (1) material designated as FILL and two (2) naturally occurring strata were characterized by EEI to exist above the dolomite bedrock. A layer of topsoil was encountered at the surface of each boring location which ranged from 0.3 to 1.0 foot thick.

Cross sections representing each boring location, displaying the various strata, as well as other information obtained from the field investigation, are included within the Appendix on the *Boring Profiles*. The testing information is also shown on the *Boring Logs*. A general description of the materials encountered is as follows:

FILL

The material designated as FILL is visually described as light brown to gray sandy silt to silty sand with gravel. The FILL material was only encountered at boring locations B-101 and B-106. Where encountered, the FILL material extended to depths of 2.0 and 1.9 feet below the existing ground surface, respectively.

The SPT (N) values recorded during the sampling of this material were 13 and 20 blows on the sampling barrel per foot of penetration. The SPT (N) results indicate that the density of the FILL material is medium dense.

STRATUM I

The soil designated as Stratum I is visually described as light brown to gray sandy silt to silty sand with clay, gravel and dolomite fragments. As determined by laboratory testing, the USCS Group Symbol for a representative sample of this material is SM. The assigned ASTM Group Name is Silty Sand with Gravel. The Stratum I material was encountered at each boring location, which extended to depths ranging from 2.5 to 18.0 feet below the existing grade.

The SPT (N) values recorded during the sampling of this material ranged from 5 to 28 blows on the sampling barrel per foot of penetration. The SPT (N) results indicate that the density of the Stratum I material is loose to medium dense. The majority of the loose portions were encountered just above the Stratum II weathered rock. In general, Stratum I is considered medium dense.

STRATUM II

The material designated as Stratum II is visually described as weathered dolomite in the form of light brown to gray sand and gravel with dolomite fragments and some silt. The Stratum II material was encountered at each testing location, which extended to the conclusion of these borings at depths ranging from 6.0 to 20.0 feet below the existing grade.

The SPT (N) values recorded during the sampling of this material ranged from 12 blows on the sampling barrel per foot of penetration to 50 blows with 2 inches of penetration. The SPT (N) results indicate that Stratum II is medium dense to very dense. The medium dense portions of the Stratum II can be attributed to sampling through the soils contained within the pinnacled rock. In addition, hard augering through this material also indicates the very dense nature of the Stratum II weathered rock.

BEDROCK

Auger/Sample barrel refusal on bedrock was encountered at five (5) boring locations at depths ranging from 6.0 to 18.7 feet below the existing ground surface. Auger refusal is typically interpreted as the drilling apparatus encountering the bedrock surface. Often times sample barrel refusal is a precursor for encountering the bedrock surface. The corresponding bedrock elevations, where encountered, are presented in Table II.

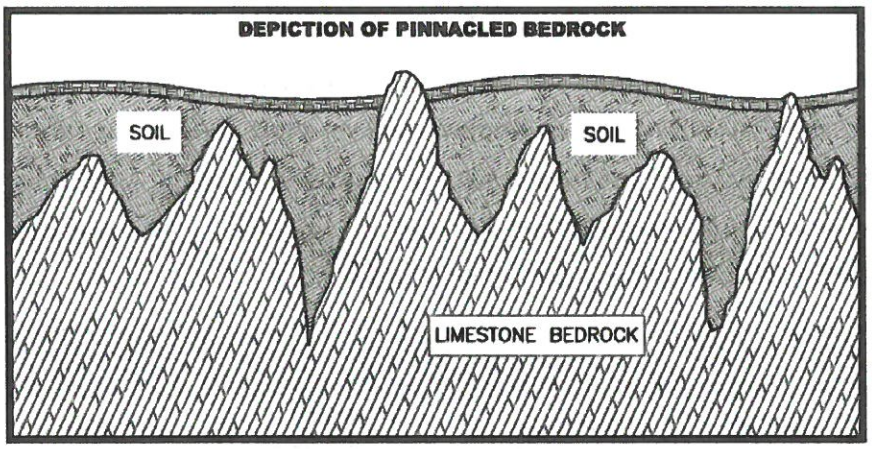
TABLE II
BEDROCK ELEVATIONS

Boring Location	[1] Surface Elevation (ft.)	Depth to Auger/Sample Barrel Refusal (ft.)	Bedrock Elevation (ft.)
B-101	385.4	[2] 18.7	366.7
B-102	383.4	7.0	376.4
B-103	383.9	6.0	377.9
B-105	386.3	18.0	368.3
B-106	385.0	13.0	372.0

Notes: [1] The surface elevations for these borings were determined by utilizing the pitching rubber on the baseball field as a reference datum. Based on conversations with SDEI, the pitching rubber elevation was 384.94 feet.

[2] Indicates Sample Barrel Refusal

As mentioned in the *GEOLOGY* section of this Report, this site is underlain by dolomite bedrock. The dolomite bedrock at this site has the potential to exist in a "saw tooth" configuration with rock potentially outcropping at the surface at one (1) location, while being fifty feet (50') deep a short, lateral distance away. Based on the corresponding bedrock elevations, it was confirmed that the existing bedrock surface is pinnacled across the site, with a minimum of eleven feet (11') of relief. The following is a graphic depiction of pinnacled bedrock:



Additional information regarding bedrock pinnacles and excavation of bedrock is presented in the *EXCAVATION METHODS* section of this Report.

C). GROUNDWATER

Groundwater was not encountered within any of the boring locations conducted, to the depths achieved. It must be noted that groundwater observations were made at the time of the drilling operation and that groundwater table elevations may fluctuate with daily, seasonal, and climatic variations.

Also note that if there is a lack of shallow groundwater that does not eliminate the possibility of water-related issues, such as surficial instabilities and saturated soils, caused by precipitation. Dewatering, whether required as a result of groundwater, surface water or precipitation, is the responsibility of the contractor.

VII. SINKHOLE DEVELOPMENT POTENTIAL

As previously discussed in the *GEOLOGY* section of this Report, the site is underlain by carbonate bedrock, which is susceptible to dissolution which results in the formation of sinkholes. Characteristics associated with this rock type commonly include localized soft and/or moist soil conditions indicative of sinkhole activity. Sinkholes are the result of soil loss, transported via infiltrating water, through voids and fractures within the bedrock. Based on the underlying geology, EEI reviewed the Open File Report for the site. The Open File Report is a geologic survey that maps sinkholes, closed depressions and other geologic features. As shown on Plate 3 included in

the Appendix of this Report, sinkholes and closed depressions were not mapped at the site. However, several closed depressions and sinkholes were mapped to the west, north and east of the site, within a few mile radius. Finally, no evidence of closed depressions and/or sinkholes was observed during the field investigation.

The potential for sinkhole development always exists in carbonate geology and no construction methodology or engineering recommendation can guarantee against the development of sinkholes. In the same vane, no remediation method for a single sinkhole guarantees that additional sinkholes will not manifest themselves in close proximity to the original.

For these reasons, contingencies should be established for the proper repair of sinkholes during construction. The risk and potential severity of sinkhole related problems can be significantly reduced by taking precautions within the design phase, as well as during and following construction. General guidelines/procedures for minimizing the potential for sinkhole development, both during and after construction, are provided in the Appendix of this Report.

VIII. SITE PREPARATION

As previously mentioned, the finished floor elevation for the proposed maintenance facility is anticipated to be 383.5 feet. EEI performed a cursory analysis of the excavations and fill placements necessary for the development of this site. Based on this analysis, excavations up to three and one half feet (3.5') and minimal fill placements will be required to establish the finished floor elevation. However, deeper excavations will be required for foundation construction, as well as storm water management and utility installations. Prior to the placement of the required structural fill, areas extending a minimum of ten feet (10') beyond the proposed construction should be stripped of all vegetation, topsoil, and other surface materials. The stripping operation should be completed to the satisfaction of the on-site representative of the Geotechnical Engineer of Record.

Following removal of the surface materials and after excavation to the proposed grades, the building pad should be proof-rolled and compacted. It is recommended that a steel drum vibratory roller having a minimum static weight of ten (10) tons be utilized for this purpose. Proof-rolling should be conducted with a minimum of two (2) passes in each direction with a smooth drum roller in static mode. Proof-rolling and compaction procedures are necessary to densify and verify the integrity of the upper zones of the soils. The proof-rolling effort will be an important aspect of the development of this site, as portions of the existing FILL material and natural soils may be

encountered in a soft/loose state. EEI anticipates that unstable areas will be encountered during the proof-rolling effort. Any loose or unstable areas encountered during proof-rolling should be evaluated for potential sinkhole conditions:

If sinkhole conditions are not encountered: The soils are most likely loose and unstable due to excessive moisture within the soil matrix. These soils can be aerated and dried in-place. Following adequate drying time, these soils can be densified in-place. Alternately, any loose or soft zones of soil can be removed and replaced with structural fill, as outlined in the *FILL AND COMPACTION* section of this Report.

If sinkhole conditions are encountered: The method of stabilization and remediation should be determined at the time of construction by a qualified representative of the Geotechnical Engineer of Record. The method of stabilization will be dependent on the height of fill placement and/or proposed site feature.

The need to excavate and replace the soft materials will be reduced if the development of the site occurs during periods of dry and warm conditions, such as the summer months. During these periods, the effectiveness of scarifying and aerating will be greatly enhanced while reducing the need to over-excavate and replace soft soils. The proof-rolling effort should be observed and evaluated in the field by a qualified representative of the Geotechnical Engineer of Record.

Due to the presence of fine-grained natural soils, it should be noted that repeated construction traffic across the site will lead to instabilities. Therefore, construction traffic should be limited across the site. The site should be graded during development to convey surface runoff away from construction. 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 and the propagation of sinkholes. Furthermore, it is recommended that all construction areas, including those which were excavated to achieve the planned subgrade elevation, be proof-rolled immediately prior to the placement of the subbase stone section and again before installation of any asphalt/concrete sections. This will allow for soft and weak areas to be observed and remediated prior to the slab placement and/or pavement construction.

IX. EXCAVATION METHODS

As previously mentioned, excavations up to approximately three and one half feet (3.5') will be required to achieve the proposed finished floor elevation of 383.5 feet. Deeper excavations will be necessary for site construction, foundation and utility installation, as well as stormwater management facility construction. Based on the borings conducted, excavations to achieve the proposed grades are expected to occur within the existing FILL and residual soils. Based on the results of the drilling operation, the existing FILL materials, Stratum I soils and portions of the Stratum II weathered rock will be easy to excavate with conventional equipment and techniques.

Very dense weathered rock, as indicated by high SPT values or hard augering, was encountered at each testing location, at depths ranging from 2.5 to 18.0 feet. As shown in the *Boring Profiles* accompanying this Report, very dense weathered rock (Stratum II) varies across the site and may be encountered during site grading activities. Table III lists the depths to the very dense weathered rock and bedrock, as well as the corresponding elevations, at the boring locations. Additional information regarding the foundations is presented in the *GEOTECHNICAL ANALYSIS* section of this Report.

TABLE III
DEPTHS OF VERY DENSE WEATHERED AND BEDROCK ELEVATIONS

Boring Number	[1] Surface Elevation, ft.	Depth to Very Dense Weathered Rock, ft.	Very Dense Weathered Rock Elevation, ft.	Depth to Bedrock, ft.	Bedrock Elevation, ft.
B-101	385.4	18.0	367.4	[2] 18.7	366.7
B-102	383.4	6.5	376.9	7.0	376.4
B-103	383.9	2.5	381.4	6.0	377.9
B-104	386.8	[3] 6.5	380.3	>20.0	<366.8
B-105	386.3	13.0	373.3	18.0	368.3
B-106	385.0	10.5	374.5	13.0	372.0

Notes: [1] The surface elevations for these borings were determined by utilizing the pitching rubber on the baseball field as a reference datum. Based on conversations with SDEI, the pitching rubber elevation was 384.94 feet.
[2] Indicates Sample Barrel Refusal
[3] Indicates intermittent augering, between easy and hard, throughout the weathered rock.

Based on the borings, very dense weathered rock and bedrock may be encountered during foundation construction. If very dense weathered rock and bedrock are encountered, improved excavation rates will be realized utilizing a late model, high power track-mounted hoe in lieu of a standard backhoe. In open excavations, the upper portions of bedrock are expected to be rippable with a late model Caterpillar D-8 Dozer or equivalent/larger, equipped with a hydraulic ripper.

Deeper excavations for utilities are expected to encounter the bedrock surface. Rock excavation within confined foundation and utility trenches is expected to require hydraulic hammering, ripping or other rock removal techniques. Due to the underlying carbonate rock, blasting is not recommended as a rock removal technique as it tends to accelerate the propagation of sinkholes. The final determination of the rock removal method(s) should comply with all Township regulations and generally accepted safety guidelines.

As previously mentioned, excavation of dolomite bedrock is considered difficult compared to other rock types due to its hardness. Bedrock pinnacles will further hamper excavations. Pinnacles are expected to be encountered between the boring locations. The dolomite bedrock at this site is in a "saw tooth" configuration. A contingency fund should be established for removal of bedrock, including bedrock pinnacles, at this site. This picture was obtained from a different site in a similar geology, which shows a pinnacled surface:

As required, temporary slopes and support for excavations should be designed and installed by the contractor in accordance with the Occupational Safety and Health Administration's (OSHA), *Safety and Health Regulations for Construction*, 29 CFR 1926, Subpart P. A competent person as defined by the aforementioned regulation is required to confirm stability of all excavations during construction. If required, the design of temporary bracing and shoring by the contractor needs to consider an active earth pressure and passive earth pressure on the temporary shoring as appropriate. Effects of any surcharges also need to be considered in the bracing design. Permanent slopes should be designed at 3 horizontal to 1 vertical or flatter.

In the event that the excavation package for this project is not being bid as "unclassified", it may be prudent to include definitions for weathered rock and bedrock, as well as unit costs for weathered rock and/or bedrock excavation/removal within the contract documents.

X. GEOTECHNICAL ANALYSIS

The results of the field investigation, supported by laboratory testing, revealed that the general geotechnical cross section consists of one (1) FILL material and two (2) naturally occurring soil strata within the proposed building pad footprint. Please note the building loads were not provided at the time of report preparation. Therefore, EEI estimated that the column loads will not exceed 100 kips, nor will the wall loads exceed 3 klf.

Based on the proposed finished floor elevation of 383.5 feet, minimal fill placement and excavations up to approximately 3.5 feet will be required. Based on the borings conducted, the majority of the FILL material will be removed during excavations to the proposed finished floor elevation. The preparation of the building pad should be conducted in accordance with the recommendations stated within the *SITE PREPARATIONS* section of this Report. Any soft/loose areas should be remediated prior to structural fill placements.

If soft/loose FILL materials and residual soils are encountered during foundation excavation, localized over excavations of the soft/loose soils to a firm and stable base at the foundation bottom elevation may be necessary. The extent of the over excavation should be confirmed in the field at the time of excavation by a qualified representative of the Geotechnical Engineering of Record. All soft/loose natural soils should be removed and replaced with structural fill. The over excavation should be backfilled with compacted lifts of structural fill to the originally proposed foundation bottom elevation. The structural fill should be placed and compacted to ninety eight percent (98%)

of the material's maximum dry density in accordance with ASTM D698. Any structural fill should be placed and compacted in accordance with the *FILL AND COMPACTION* section of this Report.

Following the site preparations and implementation of the recommendations stated above, EEI recommends supporting the proposed structure utilizing a shallow foundation system, bearing on the suitably dense existing FILL materials, Stratum I and Stratum II soils, weathered rock, bedrock, and/or newly placed structural fill. The following foundation system and soil bearing capacity recommendations are provided by EEI, in addition to those discussed above:

1. A foundation system consisting of strip and spread footings along with a slab-on-grade floor system is recommended for the proposed municipal garage building.

2. Due to the underlying geology, it is recommended that all exterior wall footings and any interior load bearing wall footings be designed to be capable of temporarily spanning a void with a diameter of 10.0 feet. This will help guard against damage to the building, should a sinkhole develop during construction.

3. The base of the strip and spread footings should be situated within suitably dense existing FILL, natural soils, and/or structural fill placed and compacted as detailed in the *FILL AND COMPACTION* section of this Report. Soft/Loose existing FILL or natural soils encountered at the footing bottom elevation should be undercut and replaced with compacted lifts of structural fill, or lean concrete. Alternately, the foundation base can be lowered to the approved soil bearing elevation. Foundations shall not bear on or above soft/loose existing FILL and/or natural soils.

4. Following the implementation of these site preparation recommendations, the foundations should be designed for a maximum allowable bearing capacity of 3,000 pounds per square foot. Regardless of the load criteria, a minimum eighteen inch (18") wide strip footing and thirty six inch (36") spread footing should be utilized.

5. Supported on the suitably dense FILL, Stratum I soil, Stratum II weathered rock, bedrock and/or properly placed structural fill, total settlements are estimated not to exceed 1.0 inch. These settlements were calculated using a bearing capacity of 3,000 pounds per square foot, and the assumed maximum column and wall loads (100 kips and 3 klf, respectively). Angular distortion of the proposed foundation is anticipated to be within the tolerable limits. Should the anticipated loads be different, EEI must be notified so our recommendations can be reviewed and revised, if necessary.

6. To minimize differential settlements, if bedrock is encountered at the proposed foundation elevation in which a foundation is situated **on both** rock and soil, the rock should be excavated one foot (1') below the proposed bearing elevation. Compacted lifts of structural fill should then be placed on top of the rock up to the proposed bearing elevation. For strip foundations, a lateral transition layer of fifteen feet (15') is recommended.

7. The bottom of exterior footings and footings in unheated areas should be placed at least thirty six inches (36") below the final exterior grade for protection from frost heave.

8. All footing bottoms should be dry and completely cleaned of loose material or debris immediately prior to the placement of concrete.

9. 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 a Professional Engineer qualified in Geotechnical Engineering.

XI. FLOOR SLAB RECOMMENDATIONS

Following the implementation of the site preparations, floor slabs may be supported on approved residual soils and/or new structural fill placed and compacted over approved subgrade soils in accordance with the *FILL AND COMPACTION* section of this Report. Due to the possibility of soft/loose existing FILL and residual soils, over excavation and replacement may be required for proper support.

Floor slabs for the proposed building may be designed as a slab-on-grade with a recommended Modulus of Subgrade Reaction value of 150 psi/inch. The subgrade should be prepared in accordance with the procedures described in this Report. In order to reduce capillary rise resulting in damp floor slabs, a granular subbase is recommended. The granular subbase will also provide uniform support distribution between the subgrade soils and the base of the concrete slab(s). It is recommended that a minimum of six inches (6") of clean, coarse-graded aggregate, (such as PA DOT 2B or other approved materials) be placed and compacted beneath all floor slab areas. The floor slabs should be suitably reinforced to control shrinkage cracking. Proper joints should be provided at the junction of the slabs and foundation system, so a small amount of independent movement can occur without causing damage.

Furthermore, from a geotechnical perspective, a vapor retarder/barrier is not required to address any issues with moisture intrusion from shallow groundwater. The need for a vapor retarder/barrier from a general construction perspective depends on the floor covering and/or

humidity control requirements in the proposed building spaces. 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 spaces are not 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 water tight 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 Structural Engineer accordingly, to determine the need for and location of a vapor retarder/barrier.

XII. LATERAL EARTH PRESSURES

The lateral earth pressure coefficients that may be used for designing below grade walls and retaining walls, if necessary, are shown in Table IV. Retaining walls which are restrained from deflection such as mechanical pits, basement walls, or loading dock walls should be designed for the at-rest (Ko) condition. Retaining walls that are free to deflect, such as landscape walls, should be designed for the active (Ka) condition. EEI recommends that a drainage system be installed for walls constructed below grade. The presence of a drainage system will serve to minimize hydrostatic pressures caused by water trapped against the walls. If adequate drainage is not provided, the walls should be designed to resist hydrostatic loads. Additionally, consideration should be given to any surcharge loads at the top of the walls.

Considered somewhat conservative, the following earth pressure data for the on-site materials was determined from the soil classification testing and visual classification of the soil samples and was compared to generally accepted and published values for the various properties.

TABLE IV
SOIL PROPERTIES FOR THE COMPUTATION OF LATERAL LOADS

	FILL & STRATUM I	STRATUM I
Effective Stress Angle of Friction – φ	28.0°	32.0°
Dry Unit Weight - γ_d	115.0 pcf	120.0 pcf
Submerged Unit Weight - γ_w	52.6 pcf	57.6 pcf
Rankine Coefficient of Active Earth Pressure - K_a	0.36	0.31
Rankine Coefficient of Passive Earth Pressure - K_p	2.77	3.25
Rankine Coefficient of at Rest Earth Pressure - K_o	0.53	0.47

It should be noted that for the design of a Segmental Retaining Wall (SRW), the National Concrete Masonry Association (NCMA) suggests that all soil placed within the reinforced zone of the system have no more than 35% passing the #200 sieve. The soil classifications, conducted by EEI as part of this investigation, indicate that placement of the Stratum I soils in the reinforced zone of an SRW is permitted. EEI recommends additional laboratory testing to be conducted ont hese soils, namely a direct shear test (ASTM D3080), or any other backfill materials considered for use. The results of this testing may allow more aggressive design parameters to be used in retaining wall design, which may effectively reduce retaining wall costs.

XIII. SITE SEISMICITY

The 2015 edition of the International Building Code (IBC) specifies seismic design requirements applicable to the structural design of the proposed maintenance garage facility for Muhlenberg Township. In particular, Chapter 16, Section 1613.3.2 is relevant to this structural design. This in turn requires that the project site be classified geotechnically as either "Site Class" A through F, based on Table 20.3-1 *Site Classification,* in Chapter 20 of ASCE 7.

ASCE Table 20.3-1
SITE CLASSIFICATION

SITE CLASS	$\bar{V}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{S}_u$
A. Hard rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff soil	***600 to 1,200 ft/s***	***15 to 50***	***1,000 to 2,000 psf***
E. Soft clay soil	<600 ft/s	15	<1,000 psf
E.	Any profile with more than 10 feet of soil having the following characteristics: - Plasticity index PI>20 - Moisture content w≥40% and - Undrained shear strength S_u<500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1 ft/s = 0.3048 m/s; 1 lb/ft² = 0.0479 kN/m²
N/A = Not Applicable

In this regard, based on a comparison of the criteria from Table 20.3-1 with the field data accumulated during the drilling for this site in June 2019, the site should be classified as Site Class "D", for purposes of implementing the IBC 2015 seismic structural design requirement. According to the IBC 2015, a Site Class "D" indicates a "stiff soil" profile.

XIV. FILL AND COMPACTION

A). FILL CRITERIA

Fill material which supports foundations, floor slabs, and pavements, as well as fill for retaining wall backfill and berm construction, is considered structural fill. Excavations required to achieve the anticipated grades may make the existing FILL material, Stratum I soils and Stratum II weathered rock available for reuse as structural fill material.

Based on visual observations, the existing FILL material is considered suitable for use as structural fill in its current condition. However, if the FILL material is encountered above optimum moisture content, these materials will require time for aerating and drying prior to use as structural fill. In addition, any soils or deleterious materials (i.e. metal, wood, etc.) which are unsuitable for reuse as structural fill should be stockpiled separately and removed from the site or placed in non-structural areas. EEI recommends that the FILL materials be further evaluated for reuse as structural fill by a representative of the Geotechnical Engineer of Record, at the time of excavation.

One (1) sample of the Stratum I soil was tested in the laboratory for natural moisture content. The result yielded a natural moisture content of 20.8 percent. Based on visual observations, supported by laboratory testing, the Stratum I soil is above optimum moisture content for this type of material. Therefore, the Stratum I soil will require time for aerating and drying prior to use as structural fill.

Based on visual observations, the Stratum II weathered rock are considered suitable for use as structural fill in its current condition. If moist zones of these materials are encountered above optimum moisture content, time for aerating and drying will be required prior to use as structural fill. Rock fragments from weathered rock and bedrock should be processed to less than three inches (3") in size and mixed with suitable soil materials during placement to provide a well-graded structural fill.

The on-site soils will require careful moisture control as they are sensitive to moisture changes. 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 pad and construction areas should be limited to minimize disturbance of the subgrade, which will lead to instabilities.

Any structural fill **imported** to the site 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 three (3) inches in diameter;
- not include deleterious materials such as construction debris, wood, glass, ash trash, refuse, roots and other organic matter;
- not contain frozen clumps of soil, snow or ice;
- have moisture contents within two (2) to three percent (3%) 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.

These criteria are provided as a general guideline for soil materials imported to the site. Soil materials available for use as a structural fill should be submitted to the Geotechnical Engineer of Record for evaluation prior to use at the site.

B). COMPACTION CRITERIA

Structural fill should generally be placed in horizontal lifts not exceeding eight inches (8") in loose thickness and compacted with a sheepsfoot or smooth drum vibratory roller with a minimum static weight of ten (10) tons. Where compaction by hand-operated equipment is necessary, structural fill should be placed in maximum horizontal lifts of six inches (6") loose thickness. 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. The fill material should be placed at its optimum moisture content (+/- 2%) as determined in accordance with ASTM D698 and compacted to a minimum percentage of the maximum dry density as indicated in Table V.

TABLE V COMPACTION CRITERIA	
Fill Area	**Percent of Maximum Dry Density as per ASTM Standard D698**
Foundation Support and Slab-on-Grade	98
Paved Areas, Walkways, and Berms	95
Non-Structural	92

XV. CONSTRUCTION QUALITY CONTROL

As documented within this Report, the proposed construction is anticipated to include significant earthwork procedures and foundation construction activities. 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 past experience, the most effective and economical earthwork inspection is obtained through the on-site presence of a qualified representative of the Geotechnical Engineer of Record during the placement of structural fill and the installation of structural elements. Therefore, it is recommended that the proof-rolling effort, excavation and placement of fill, sinkhole remediation, and verification of the installation of foundation elements be tested and confirmed by Earth Engineering Incorporated. However, it must be noted, the presence of any third party Inspection Agency does not relieve the contractor from responsibility for *Means and Methods* of construction and proper performance of the components included in their work scope.

XVI. LIMITATIONS

The conclusions and recommendations contained in this Report are based upon the subsurface data collected, and on details stated in this Report, as well as the assumption that the subsurface conditions across the site do not deviate appreciably from those disclosed by the test borings performed.

Unless specifically indicated to the contrary herein, the scope of this Report is limited only to investigations and evaluation of the geotechnical aspects of the site conditions, and does not include any consideration of potential site pollution, contamination or other environmental issues. This Report offers no facts or opinions related to potential pollution or contamination of the site.

The procedures followed for the subsurface exploration, analysis and conclusion development have followed generally accepted geotechnical engineering practices and make 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 assume that recognized proper construction practices are followed throughout construction and that a Professional Engineer qualified in geotechnical engineering will be retained to oversee the inspection of site preparations, proof-rolling, foundation construction, sinkhole remediation and other critical earthwork operations.

It is important to note that at the time of report preparation, the building loads were not established so EEI based all analyses on assumed values. This information is vital to providing a recommended foundation type, as well as accurate recommendations regarding bearing capacity and settlement estimates. After the loads are determined, EEI can better establish the foundation design recommendations best suited for this project.

It is emphasized that this analysis was made for the proposed maintenance garage for the Municipality of Muhlenberg Township to be located along Leesport Avenue in Muhlenberg Township, Berks County, Pennsylvania. Earth Engineering Incorporated does not assume any responsibility in using this Report to generate foundation design other than at the specific site addressed.

Respectfully submitted,
EARTH ENGINEERING INCORPORATED

Michael J. Carmosky, SEO
Assistant Director ~ Lehigh Valley Division

Michael O. Meixell, P.E.
Director of Engineering ~ Lehigh Valley Division

Paul J Creneti, P.G.
Director~ Lehigh Valley Division

APPENDIX

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES
Visit us at http://www.dcnr.state.pa.us

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Created using PA DCNR Map Viewer
Copyright 2011 Esri. All rights reserved
Temple Quadrangle
Map created on Mon Jun 10 2019

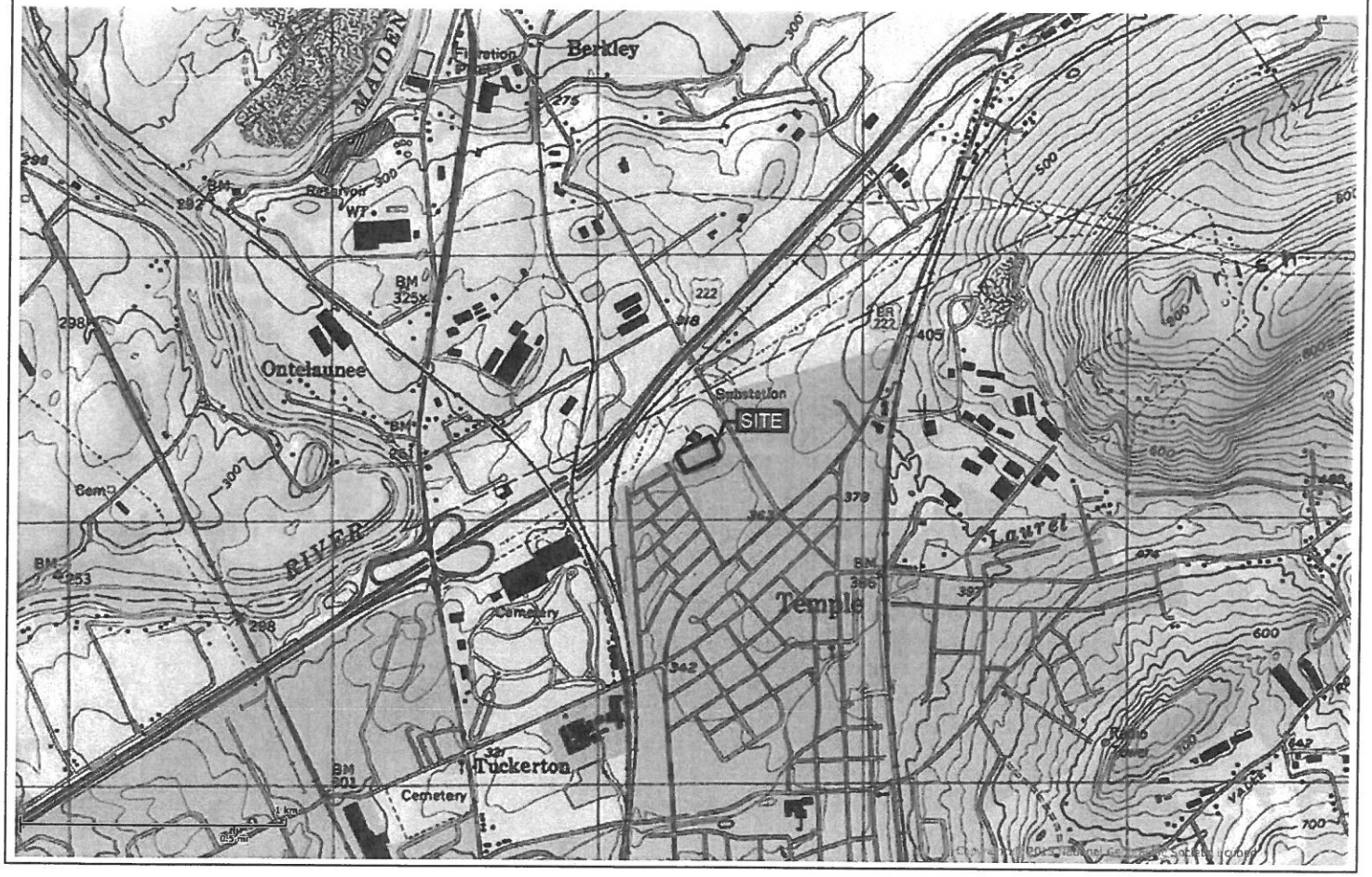

PLATE 1 - TOPOGRAPHIC MAP OF SITE

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES
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Temple Quadrangle
Map created on Mon Jun 10 2019

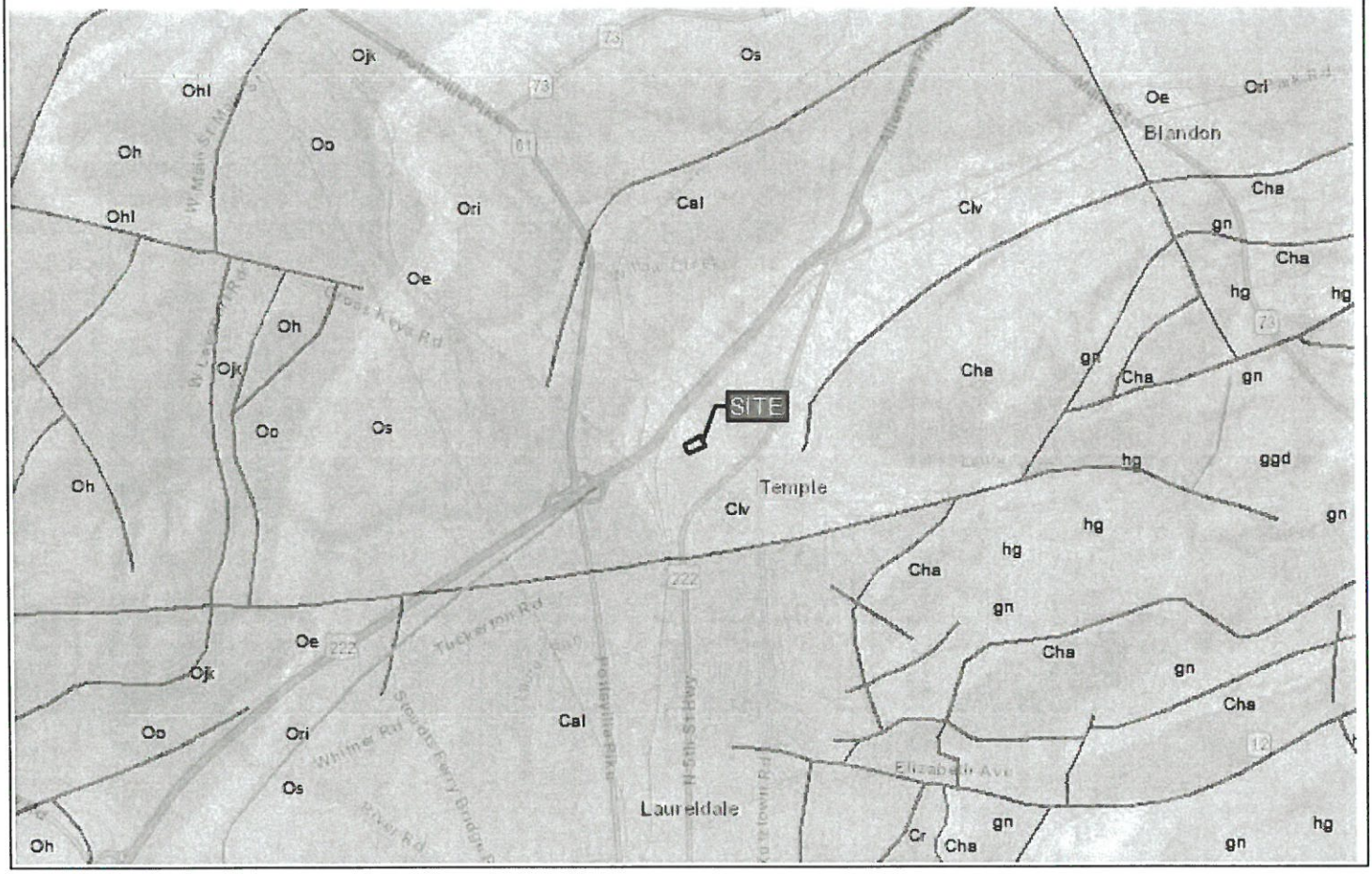

PLATE 2 - BEDROCK GEOLOGY MAP OF SITE

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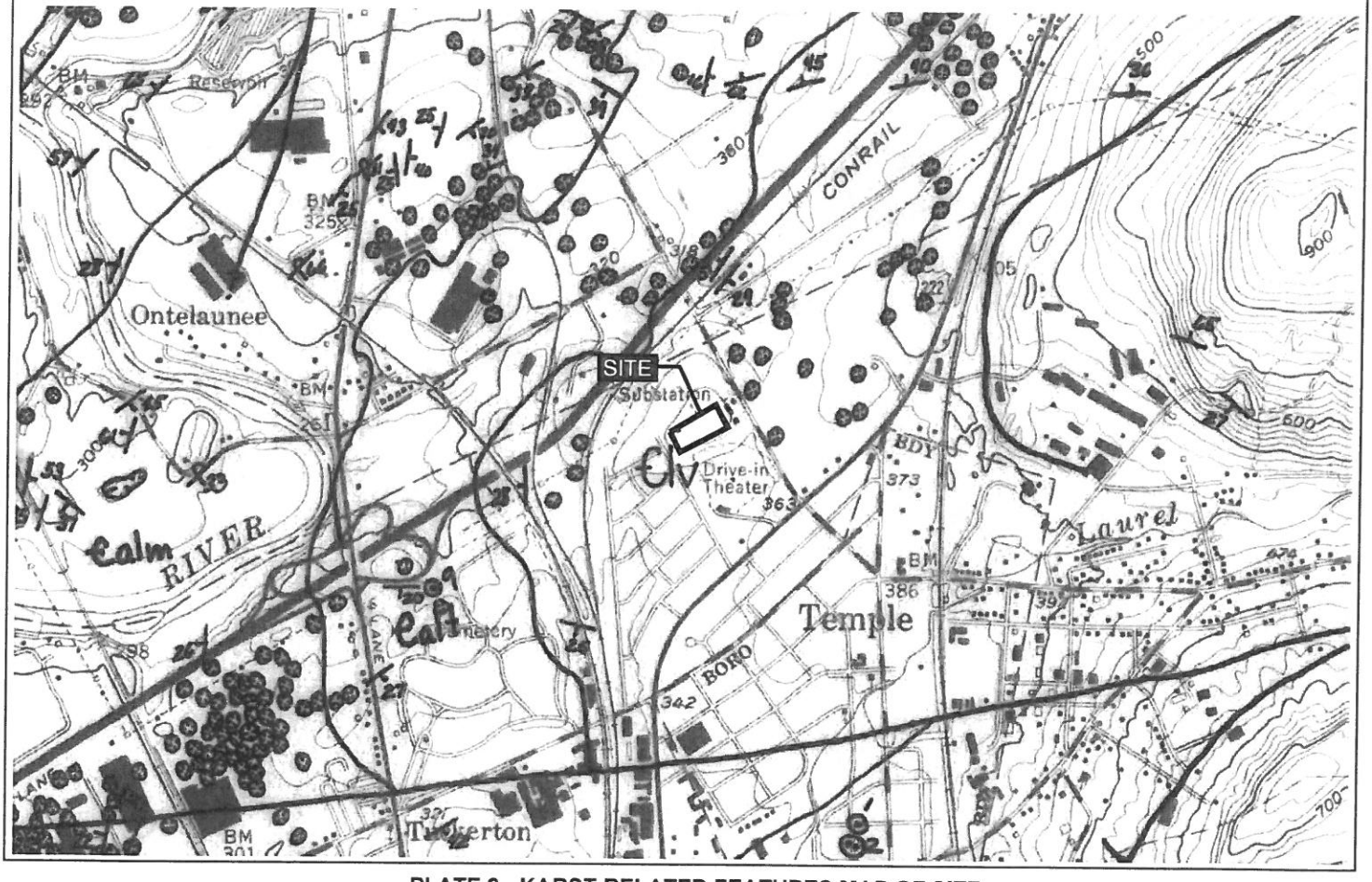
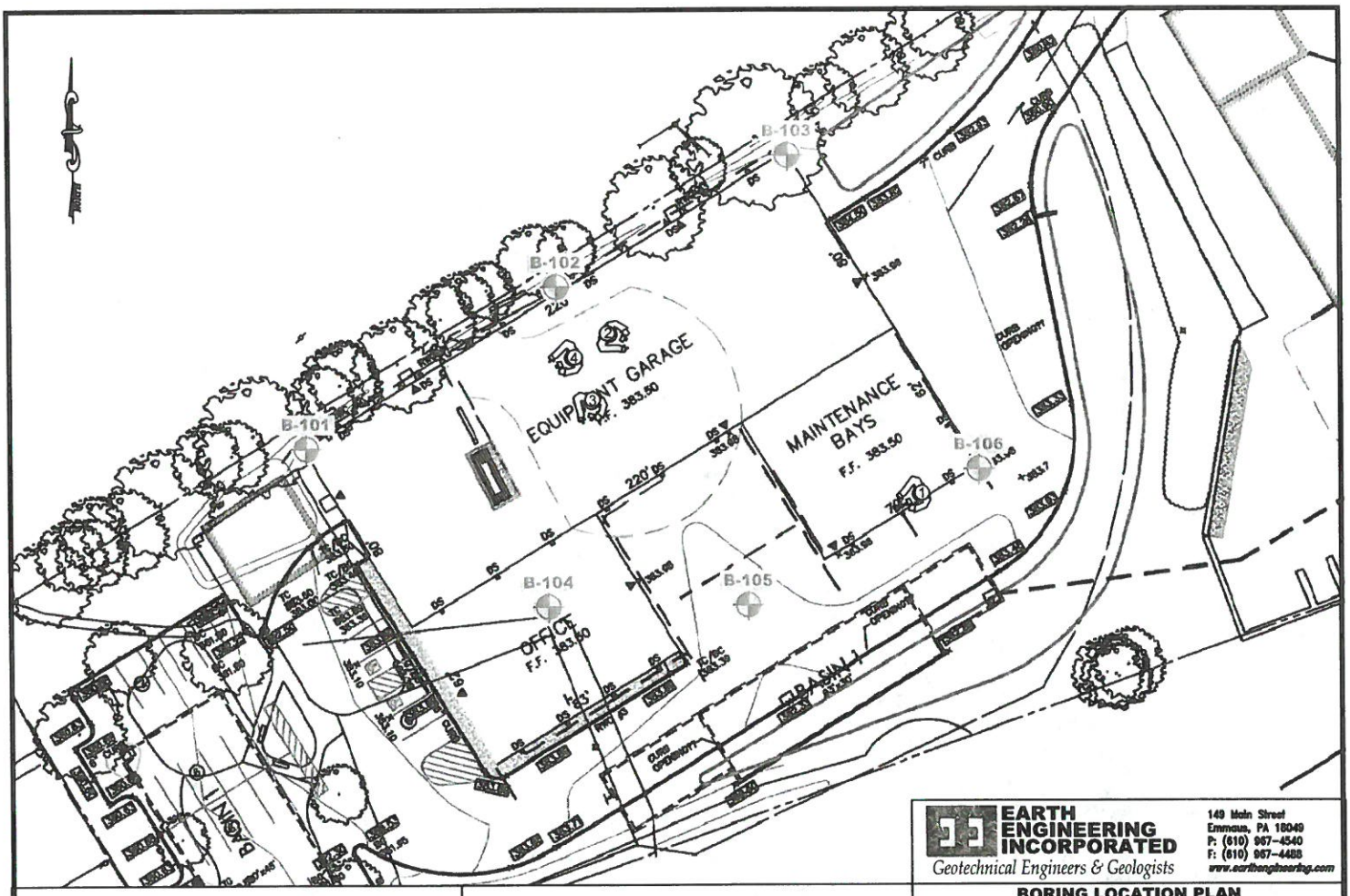


PLATE 3 - KARST-RELATED FEATURES MAP OF SITE

As reprinted from the Commonwealth of Pennsylvania, Topographic and Geologic Survey, *Sinkholes And Karst-Related Features of Berks County, Pennsylvania,* Temple Quadrangle, Open File Report 8801 by W.E. Kochanov, 1988



EARTH ENGINEERING INCORPORATED
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F: (610) 967-4488
www.earthengineering.com

GRAPHIC SCALE

(IN FEET)
1 inch = 50 feet

KEY:

B-100 — INDICATES BORING LOCATION

INDICATES PHOTOGRAPH LOCATION (REFER TO REPORT)

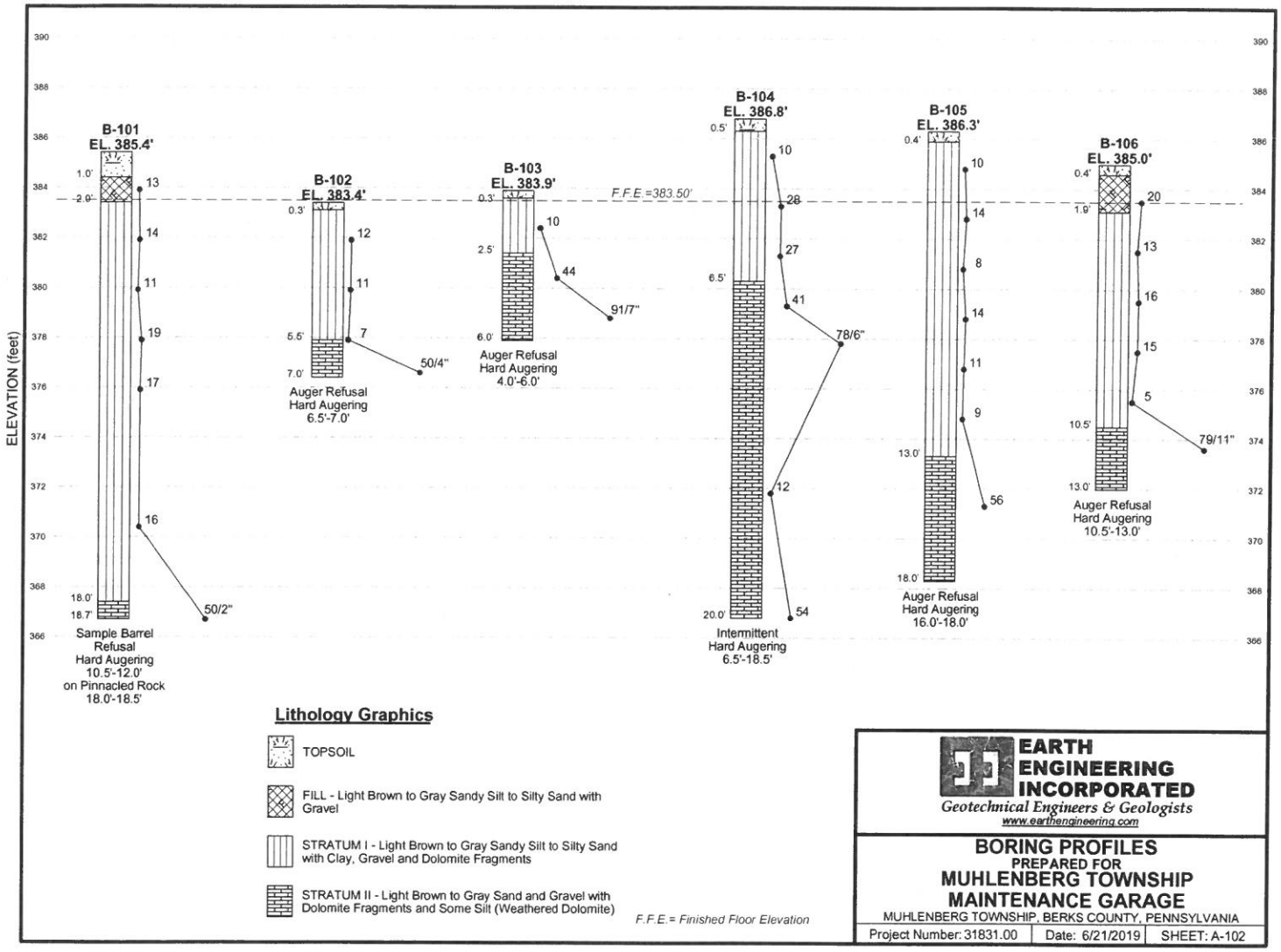
BASE PLAN PROVIDED BY SYSTEM DESIGN ENGINEERING

BORING LOCATION PLAN
MUHLENBERG TOWNSHIP
MAINTENANCE GARAGE

PREPARED FOR
SYSTEM DESIGN ENGINEERING
MUHLENBERG TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

Scale	Date	Drawn By	Checked By
1" = 50'	6/21/2019	JLM	MJC

Drawing Number: 31831.00-A-101 — Approved By: PJC



Lithology Graphics

- TOPSOIL
- FILL - Light Brown to Gray Sandy Silt to Silty Sand with Gravel
- STRATUM I - Light Brown to Gray Sandy Silt to Silty Sand with Clay, Gravel and Dolomite Fragments
- STRATUM II - Light Brown to Gray Sand and Gravel with Dolomite Fragments and Some Silt (Weathered Dolomite)

F.F.E.= Finished Floor Elevation

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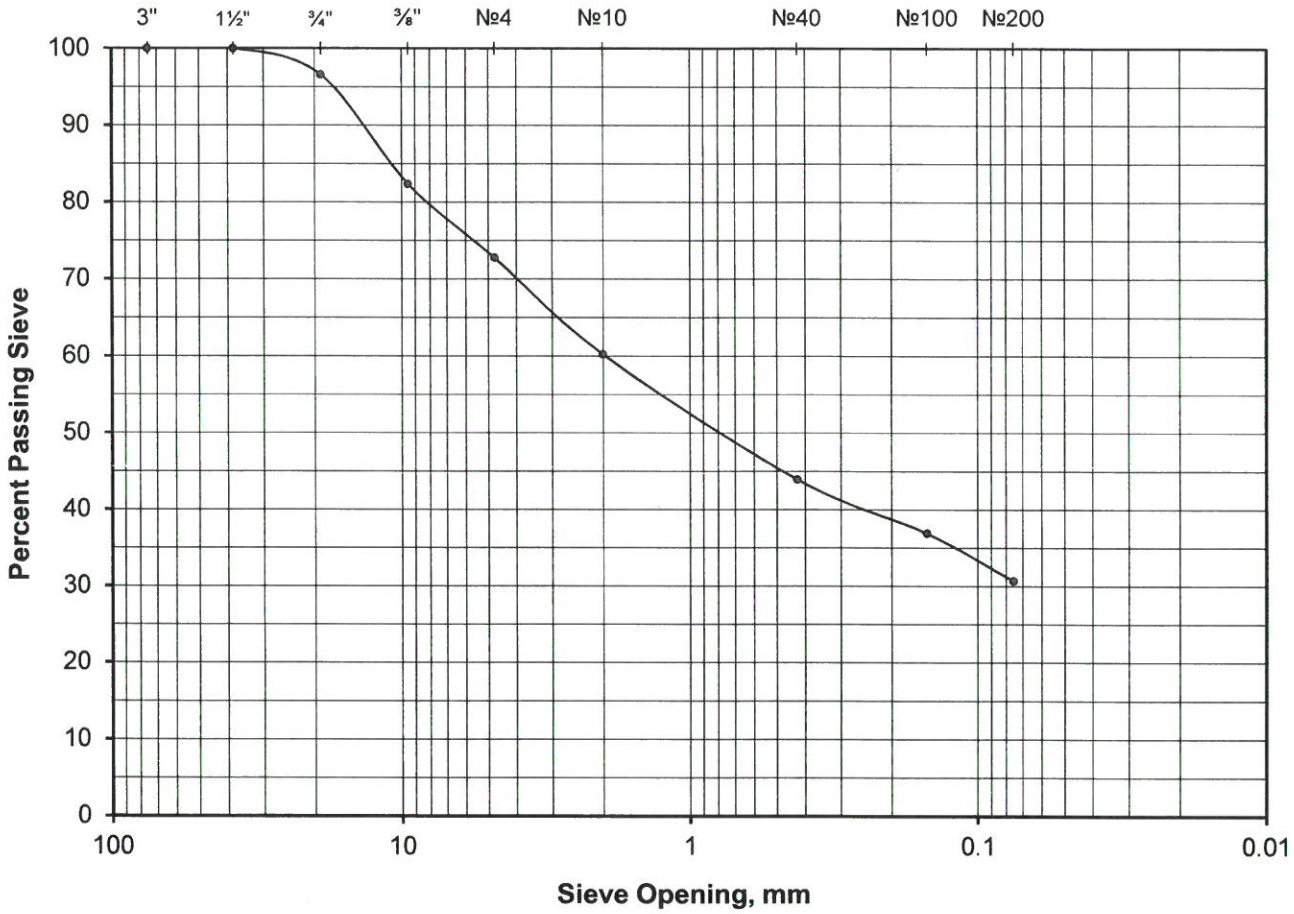
BORING PROFILES
PREPARED FOR
MUHLENBERG TOWNSHIP MAINTENANCE GARAGE
MUHLENBERG TOWNSHIP, BERKS COUNTY, PENNSYLVANIA

Project Number: 31831.00	Date: 6/21/2019	SHEET: A-102

Particle Size Analysis of Soils



As-rec'd water content: 20.8		**Odor:** N/R	
% Gravel: 27.2	**Coarse:** 3.4	**Fine:** 23.8	
% Sand: 42.1	**Coarse:** 12.5	**Medium:** 16.3	**Fine:** 13.2
Gravel Description: subrounded, rounded, weathered, flat pieces, dolomite, gray, light brown			
Sand Description: subrounded, rounded, extreemly weathered, flat/long pieces, dolomite, gray, brown			
Consistency: firm		**Hardness:** N/R	
Cementation: moderate		**Dry Strength:** medium	
Structure: homogeneous		**Dilatency:** N/R	
Reaction to HCl: N/R		**Toughness:** N/R	
USCS Classification: SM, Silty Sand with Gravel			
AASHTO Classification: A-2-4			

Particle Size				
US Standard Sieve Size			Diameter, mm	% Finer
GRAVEL	Coarse	3"	75	100.0
		1½"	38.1	100.0
		¾"	19.0	96.6
	Fine	⅜"	9.5	82.4
		№ 4	4.75	72.8
SAND	Coarse	№ 10	2.00	60.2
	Medium	№ 40	0.425	43.9
	Fine	№ 100	0.150	36.9
		№ 200	0.075	30.7
Hydrometer Analysis		Clay Size	0.005	NR
		Colloids	0.001	NR

G_s: N/A	**Cu:** N/A	**Cc:** N/A
LL: NP	**PL:** NP	**PI:** NP

Project: Muhlenberg Township Maintenance Garage
Job #: 31831.00
Client: Systems Design Engineering, Inc.
Sample: B-105 / S-3, S-4
Depth: 4.0'-8.0'
Comments: **STRATUM I**
NP - Indicates Sample is Non Plastic

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Geotechnical Engineers & Geologists
149 Main Street, Emmaus, PA 18049
Tel: 610-967-4540 Fax: 610-967-4488

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BORING LOG

BORING NO. B-101
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 385.4

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 18.5'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: ____ TIME: ____ DATE: ____
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH (feet) ELEVATION (feet)	
0.0	S-1	1 5 8 9	0.7'	-	ml	M		TOPSOIL	PP=Pocket Penetrometer (tsf=tons per square foot)
								1.0 384.4	
								FILL - Brown to Gray Sandy Silt with Rock Fragments	S-1 - PP=1.00 tsf
2.0								2.0 383.4	
	S-2	7 7 7 7	1.1'	-	ml	M		STRATUM I - Brown Sandy Silt to Silty Sand with Clay and Dolomite Fragments	S-2 - PP=1.75 tsf
4.0	S-3	6 5 6 7	1.3'	-	ml	M			S-3 - PP=2.00 tsf
6.0	S-4	9 9 10 10	1.0'	-	sm	M			
8.0	S-5	9 8 9 15	1.2'	-	sm	M			
10.0									Hard Augering on Pinnacled Rock 10.5'-12.0'
13.5	S-6	7 8 8	1.5'	-	cl	M			S-6 - PP=4.00 tsf
15.0									
								18.0 367.4	
18.5				-				STRATUM II - Light Brown to Gray Sand	Hard Augering 18.0'-18.5'
18.7	S-7	50/2"	0.1'		gm	M		18.7 and Gravel with Dolomite Fragments and Some Silt (Weathered Dolomite) 366.7	Sample Barrel Refusal

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

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BORING LOG

BORING NO. B-102
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 383.4

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 7.0'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH (feet) ELEVATION (feet)	
0.0	S-1	3 5 7 6	1.3'	-	ml	M		0.3 TOPSOIL 383.1 STRATUM I - Light Brown Sandy Silt to Silty Sand	PP=Pocket Penetrometer (tsf=tons per square foot) S-1 - PP=1.50 tsf
2.0	S-2	5 6 5 6	0.9'	-	ml	M			S-2 - PP=1.75 tsf
4.0	S-3	4 3 4 11	1.5'	-	sm	M		5.5 377.9 STRATUM II - Light Brown to Gray Sand with Dolomite Fragments (Weathered Dolomite)	
6.0	S-4	11 50/4"	0.7'	-	gm	M		7.0 376.4	Hard Augering 6.5'-7.0' Auger Refusal
6.8									

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

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BORING LOG

BORING NO. B-103
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 383.9

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 6.0'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: ____ TIME: ____ DATE: ____
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
0.0								DEPTH (feet) ELEVATION (feet)	
	S-1	4 5 5 5	1.2'	-	sm	M		0.3 TOPSOIL 383.6 STRATUM I - Light Brown to Gray Silty Sand	
2.0								2.5 381.4	
	S-2	8 21 23 25	0.8'	-	gm	D		STRATUM II - Light Brown to Gray Sand and Gravel with Dolomite Fragments and Some Silt (Weathered Dolomite)	
4.0									Hard Augering 4.0'-6.0'
	S-3	37 41 50/1"	0.5'	-	gm	D			
5.1								6.0 377.9	
									Auger Refusal

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

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BORING LOG

BORING NO. B-104
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 386.8

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 18.5'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH (feet) ELEVATION (feet)	
0.0	S-1	1 4 6 6	1.3'	-	ml	M		0.5 386.3 TOPSOIL STRATUM I - Light Brown Sandy Silt to Silty Sand	PP=Pocket Penetrometer (tsf=tons per square foot) S-1 - PP=2.00 tsf
2.0	S-2	7 13 15 13	1.2'	-	ml	M			S-2 - PP=3.25 tsf
4.0	S-3	7 13 14 13	1.4'	-	sm	M			
6.0	S-4	11 21 20 9	0.9'	-	sm	M		6.5 380.3 STRATUM II - Light Brown to Gray Sand and Gravel with Dolomite Fragments and Some Silt (Weathered Dolomite)	Intermediate Augering from 6.5'-18.5'; Soft Zones Encountered During Augering
8.0	S-5	7 28 50/0"	0.5'	-	gm	M			
9.0									
13.5	S-6	8 7 5	1.4'	-	sm	M			
15.0									
18.5	S-7	18 19 35	1.0'	-	gm	M		20.0 366.8	End of Boring
20.0									

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

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BORING LOG

BORING NO. B-105
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 386.3

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 18.0'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: _____ TIME: _____ DATE: _____
DEPTH: _____ TIME: _____ DATE: _____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH (feet) ELEVATION (feet)	
0.0								0.4 TOPSOIL 385.9	PP=Pocket Penetrometer (tsf=tons per square foot)
	S-1	1 4 6 10	1.7'	-	ml	M		STRATUM I - Light Brown to Gray Sandy Silt to Silty Sand with Gravel	S-1 - PP=2.25 tsf
2.0									
	S-2	8 7 7 5	1.1'	-	ml	M			S-2 - PP=2.00 tsf
4.0									
	S-3	4 4 4 5	1.0'	-	SM	M			
6.0									
	S-4	8 7 7 8	0.8'	-	SM	M			
8.0									
	S-5	9 6 5 4	0.7'	-	sm	M			
10.0									
	S-6	4 4 5 6	1.2'	-	sm	M			
12.0									
								13.0 373.3	
13.5								STRATUM II - Gray Sand and Gravel with Dolomite Fragments and Some Silt (Weathered Dolomite)	
	S-7	26 29 27	0.8'	-	gm	M			
15.0									Hard Augering 16.0'-18.0'
								18.0 368.3	
									Auger Refusal

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

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BORING LOG

BORING NO. B-106
SHEET 1 OF 1
DATE: START 6/12/19
END 6/12/19
SURFACE ELEV. (FT) 385.0

PROJECT NAME Muhlenberg Twp. Maintenance Garage
PROJECT LOCATION Muhlenberg Township, Berks County, Pennsylvania
PROJECT NUMBER 31831.00
INSPECTOR NAME D. Folk
EQUIPMENT USED Truck Mounted Drill Rig - Mobile B-47
DRILLER NAME/COMPANY Bill Corcoran/Main Line Drilling Company
DRILLING METHODS 2 inch O.D. Split Barrel Sampler, 6 inch O.D. Hollow Stem Auger
CASING: SIZE: 3 1/4 inch I.D. ; DEPTH: 13.0'
CHECKED BY: MJC ; DATE: 6/13/2019
WATER: DEPTH: ____ TIME: ____ DATE: ____
DEPTH: ____ TIME: ____ DATE: ____
NOT ENCOUNTERED [X]

DEPTH (FT)	SAMPLE NO./ TYPE/CORE RUN	BLOWS/0.5 FT. ON SAMPLER	RECOVERY (Ft.)	RECOVERY(%) / RQD (%)	USCS / AASHTO	H_2O CONTENT	GRAPHIC LOG	DESCRIPTION	REMARKS
								DEPTH (feet) ELEVATION (feet)	
0.0								0.4 TOPSOIL 384.6	PP=Pocket Penetrometer (tsf=tons per square foot)
	S-1	2 6 14 7	1.6'	-	sm	M		FILL - Brown to Gray Sand and Gravel with Some Silt	
2.0								1.9 383.1	
	S-2	6 6 7 10	1.3'	-	ml	M		STRATUM I - Brown to Gray Sandy Silt to Silty Sand	S-2 - PP=2.00 tsf
4.0									
	S-3	7 7 9 10	1.2'	-	ml	M			S-3 - PP=2.75 tsf
6.0									
	S-4	8 8 7 8	1.0'	-	ml	M			S-4 - PP=2.50 tsf
8.0									
	S-5	4 3 2 2	1.2'	-	ml	M			
10.0								10.5 374.5	
	S-6	12 23 50/5"	0.7'	-	gm	M		STRATUM II - Light Gray Sand and Gravel with Dolomite Fragments (Weathered Dolomite)	Hard Augering 10.5'-13.0'
11.4								13.0 372.0	Auger Refusal

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

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)			
Clean Gravels (Less than 5% fines)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size		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 (More than 12% fines)			
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
Clean Sands (Less than 5% fines)			
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size		SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
Sands with fines (More than 12% fines)			
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more 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 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

AASHTO SOIL CLASSIFICATION

General Classification	Granular Materials (35% or less of total sample passing No. 200 sieve size)							Silt-Clay Materials (More than 35% of total sample passing No. 200 sieve size)			
Group Classification	A-1		A-3	A-2				A-4	A-5	A-6	A-7
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6
Sieve Analysis Percent Passing No. 10	50 max										
No. 40	30 max	50 max	51 max								
No. 200	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
Characteristics of Fraction Passing No. 40											
Liquid Limit, wi				40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min
Plastic Index, Ip	6 max		NP	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min
Significant Constituent Materials	gravel and sand		fine sand	silty and clayey gravel and sand				silty soils		clayey soils	

SOIL MOISTURE

MOISTURE	SYMBOL	DESCRIPTION
Dry	Dr	Absence of moisture; dusty; completely dry to the touch
Damp	Da	Slight moisture perceptible by touch; fine grained soils are usually firm; granular soils have very little apparent cohesion
Moist	M	No visible free water; sample may be cool to the touch; at or above optimum moisture; granular soils might exhibit slight apparent cohesion
Wet	W	Visible free water; usually soil is below water table; contains significantly more mosture than moist soils; fine grained soils usually soft or very soft; granular soils exhibit no apparent cohesion

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT # Blows/ft	Field Test	Unconfined Compressive Strength (tons/sq.ft.)
Very soft	<2	Extruded between fingers when squeezed	< 0.25
Soft	2 - 4	Molded by light finger pressure	0.25 - 0.50
Medium stiff	5 - 8	Molded by strong finger pressure	0.50 - 1.0
Stiff	9 - 15	Readily indented by thumb but penetrated only with great effort	1.0 - 2.0
Very stiff	16 - 30	Readily indented by thumbnail	2.0 - 4.0
Hard	>30	Indented with difficulty by thumbnail	> 4.0

COMPONENT NAME FOR VARIOUS PARTICAL SIZE RANGES

ASTM D 422-63 AND ASTM D2487-92

INCHES	COMPONENT NAME
> 12"	BOULDER
3.0"-12.0"	COBBLE
3/4"-3.0"	Coarse GRAVEL
3/16"-3/4"	Fine GRAVEL
3/32"-3/16"	Coarse SAND
#40 Seive-#10 Seive	Medium SAND
#200 Seive-#40 Seive	Fine SAND
Passing #200 Seive	SILT
Passing #200 Seive	CLAY

PERCENT OR PROPORTION OF SOIL

DESCRIPTION	RELATIVE AMOUNT
trace	0 - 10%
little	10 - 20%
some	20 - 35%
and	35 - 50%

RELATIVE DENSITY COARSE-GRAINED SOIL

APPARENT DENSITY	SPT # Blows/ft
Very loose	0 - 4
Loose	5 - 10
Medium dense	11 - 30
Dense	31 - 50
Very dense	Over 50

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KEY TO LOG OF BORINGS

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RECOMMENDED CONSTRUCTION PRACTICES FOR MINIMIZING SINKHOLE DEVELOPMENT IN CARBONATE AREAS

1. Utmost care must be taken to prevent collection and drainage of surface water into excavated or low-lying areas of the site during the excavation and construction of roadways, ramps, or structures. This may be done by constructing earth berms, dikes, or diversion ditches around open excavations or otherwise preventing the collection and ponding of water in low-lying areas. Typically, excavations should not be made during predicted periods of precipitation. Excavations should be filled as soon as practical, especially over weekends or periods of inactivity.

2. The soil situated above a zone of solution activity is usually soft and wet. It is, therefore, important to locate areas exhibiting these conditions, wherever they may exist or be encountered. If structural fill is to be placed in areas suspected of sinkhole activity, the subgrade should be proof-rolled and all soft areas suitably replaced and compacted prior to construction. If the area is to be excavated, proof-rolling should be conducted after excavating to the finished subgrade elevation. Proof-rolling should be conducted under the observations of a representative of the Geotechnical Engineer of Record.

3. Soft soil must be removed and replaced with clean fill placed and compacted in accordance with the *FILL AND COMPACTION* section of this report.

4. The base of all excavations in carbonate areas should be inspected for soft or unusually moist conditions. A visual inspection of the excavated surface, as well as probes of the soil at regular intervals, is recommended. Any soft or unusually moist soil should be further excavated and a determination of the extent of the problem be made. Remedial measures should then be undertaken as necessary. Swales, drainage ditches and/or basins are particularly vulnerable to sinkhole development during periods of heavy rainfall. The same is true of outlet locations for drainage pipes. EEI recommends lining these areas with natural clay or impermeable liners to minimize infiltration of water.

5. Excavation should be kept to a practical minimum in areas of known or suspected sinkhole or solution activity. In general, the closer excavations get to the rock surface, the greater the potential is for sinkhole development.

6. The proper stabilization of sinkholes or other areas exhibiting solution activity is critical and should be performed under the direction of experienced Geotechnical Engineers.

7. Watertight seals should be provided at all water bearing utility line connections. All roof drains should be watertight and should connect to the on-site stormwater management systems.

8. Site grades should provide positive drainage away from building areas.

9. Joints between asphalt paving and concrete curbing should be sealed to reduce water infiltration in these areas.

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project Name:	Muhlenberg Township Public Works Building
Awarding Agency:	Muhlenberg Township
Contract Award Date:	12/20/2019
Serial Number:	19-07713
Project Classification:	Building/Highway
Determination Date:	11/1/2019
Assigned Field Office:	Scranton
Field Office Phone Number:	(570)963-4577
Toll Free Phone Number:	(877)214-3962
Project County:	Berks County

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	6/26/2017		$32.00	$26.51	$58.51
Asbestos & Insulation Workers	7/2/2018		$32.80	$26.76	$59.56
Asbestos & Insulation Workers	7/2/2019		$33.80	$27.26	$61.06
Asbestos & Insulation Workers	7/2/2020		$32.80	$30.01	$62.81
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2017		$28.52	$18.22	$46.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2018		$29.52	$18.22	$47.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	1/1/2019		$29.26	$18.48	$47.74
Boilermakers	1/1/2018		$46.26	$33.36	$79.62
Boilermakers	3/1/2018		$45.89	$33.73	$79.62
Boilermakers	1/1/2019		$45.51	$34.11	$79.62
Boilermakers	8/1/2019		$47.21	$34.11	$81.32
Bricklayer (Pointer, Cleaner, Caulker, Cement Mason, Plasterer, Tile Setter)	5/1/2018		$29.40	$20.35	$49.75
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2017		$34.11	$15.19	$49.30
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2018		$34.53	$15.57	$50.10
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2019		$35.04	$15.96	$51.00
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2020		$35.64	$16.36	$52.00
Bricklayers, Stone Masons, Pointers, Caulkers, Cleaners	5/1/2021		$36.33	$16.77	$53.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2017		$30.05	$16.05	$46.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2018		$29.53	$16.20	$45.73
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2019		$30.18	$16.65	$46.83
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2020		$30.88	$17.10	$47.98
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2021		$31.77	$17.41	$49.18
Cement Finishers	5/1/2017		$35.87	$12.93	$48.80
Cement Masons	5/1/2019		$31.00	$22.68	$53.68
Cement Masons	5/1/2019		$30.30	$20.40	$50.70
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2018		$43.45	$34.47	$77.92
Dockbuilder/Piledriver (Building, Heavy, Highway)	11/1/2017		$43.45	$33.22	$76.67
Dockbuilder/Piledriver (Building, Heavy, Highway)	5/1/2018		$44.70	$33.22	$77.92
Drywall Finisher	5/1/2017		$27.81	$18.17	$45.98
Drywall Finisher	5/1/2019		$28.58	$19.64	$48.22
Electricians	9/1/2017		$34.77	$21.77	$56.54
Electricians	9/1/2018		$36.02	$22.51	$58.53
Electricians	9/1/2019	8/31/2020	$36.77	$23.53	$60.30
Electricians	9/1/2020		$38.27	$23.60	$61.87
Elevator Constructor	1/1/2018		$47.48	$33.00	$80.48

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Floor Coverer	5/1/2019		$31.54	$17.89	$49.43
Floor Coverer	5/1/2020		$32.66	$17.89	$50.55
Floor Layer	5/1/2017		$30.80	$16.71	$47.51
Glazier	5/1/2017		$34.69	$18.05	$52.74
Glazier	5/1/2018		$35.69	$18.35	$54.04
Glazier	5/1/2019	4/30/2020	$35.53	$20.06	$55.59
Glazier	5/1/2020	4/30/2021	$35.53	$21.51	$57.04
Glazier	5/1/2021		$35.53	$22.86	$58.39
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2017		$31.33	$28.42	$59.75
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2018		$32.53	$28.42	$60.95
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2019		$32.76	$29.88	$62.64
Laborers (Class 01 - See notes)	5/1/2017		$21.57	$15.04	$36.61
Laborers (Class 01 - See notes)	5/1/2018	4/30/2019	$22.07	$15.59	$37.66
Laborers (Class 01 - See notes)	5/1/2019	4/30/2020	$23.02	$15.92	$38.94
Laborers (Class 01 - See notes)	5/1/2020		$22.07	$17.92	$39.99
Laborers (Class 02 - See notes)	5/1/2017		$23.57	$15.04	$38.61
Laborers (Class 02 - See notes)	5/1/2018		$24.07	$15.59	$39.66
Laborers (Class 02 - See notes)	5/1/2019	4/30/2020	$25.02	$15.92	$40.94
Laborers (Class 02 - See notes)	5/1/2020		$24.07	$17.92	$41.99
Laborers (Class 03 - See notes)	5/1/2017		$25.57	$15.58	$41.15
Laborers (Class 03 - See notes)	5/1/2018	4/30/2019	$25.82	$15.84	$41.66
Laborers (Class 03 - See notes)	5/1/2019		$26.87	$15.94	$42.81
Laborers (Class 04 - See notes)	5/1/2017		$26.77	$15.58	$42.35
Laborers (Class 04 - See notes)	5/1/2018	4/30/2019	$27.32	$15.84	$43.16
Laborers (Class 04 - See notes)	5/1/2019		$28.37	$15.94	$44.31
Laborers (Class 05 - See notes)	5/1/2017		$27.27	$15.58	$42.85
Laborers (Class 05 - See notes)	5/1/2018	4/30/2019	$27.82	$15.84	$43.66
Laborers (Class 05 - See notes)	5/1/2019		$28.87	$15.94	$44.81
Laborers (Class 06 - See notes)	5/1/2017		$22.92	$15.04	$37.96
Laborers (Class 06 - See notes)	5/1/2018	4/30/2019	$23.42	$15.59	$39.01
Laborers (Class 06 - See notes)	5/1/2019		$24.37	$15.92	$40.29
Laborers (Class 06 - See notes)	5/1/2020		$24.37	$16.97	$41.34
Marble Mason	5/1/2017		$30.14	$14.75	$44.89
Marble Mason	5/1/2018		$30.76	$15.13	$45.89
Marble Mason	5/1/2019		$31.37	$15.52	$46.89
Marble Mason	5/1/2020		$31.97	$15.92	$47.89
Marble Mason	5/1/2021		$32.56	$16.33	$48.89
Millwright	7/1/2017		$36.49	$18.93	$55.42
Millwright	5/1/2018		$37.84	$19.64	$57.48
Millwright	5/1/2019		$39.14	$20.08	$59.22
Operators (Building, Class 01 - See Notes)	5/1/2017		$35.24	$24.58	$59.82
Operators (Building, Class 01 - See Notes)	5/1/2018		$36.78	$25.03	$61.81

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Building, Class 01 - See Notes)	5/1/2019		$36.78	$27.03	$63.81
Operators (Building, Class 01 - See Notes)	5/1/2020		$38.32	$27.49	$65.81
Operators (Building, Class 01 - See Notes)	5/1/2021		$39.87	$27.94	$67.81
Operators (Building, Class 01A - See Notes)	5/1/2017		$37.49	$25.23	$62.72
Operators (Building, Class 01A - See Notes)	5/1/2018		$39.03	$25.69	$64.72
Operators (Building, Class 01A - See Notes)	5/1/2019		$39.03	$27.69	$66.72
Operators (Building, Class 01A - See Notes)	5/1/2020		$40.57	$28.15	$68.72
Operators (Building, Class 01A - See Notes)	5/1/2021		$42.12	$28.60	$70.72
Operators (Building, Class 02 - See Notes)	5/1/2017		$34.96	$24.49	$59.45
Operators (Building, Class 02 - See Notes)	5/1/2018		$36.50	$24.95	$61.45
Operators (Building, Class 02 - See Notes)	5/1/2019		$36.50	$26.94	$63.44
Operators (Building, Class 02 - See Notes)	5/1/2020		$38.05	$27.39	$65.44
Operators (Building, Class 02 - See Notes)	5/1/2021		$39.59	$27.85	$67.44
Operators (Building, Class 02A - See Notes)	5/1/2017		$37.21	$25.16	$62.37
Operators (Building, Class 02A - See Notes)	5/1/2018		$38.75	$25.61	$64.36
Operators (Building, Class 02A - See Notes)	5/1/2019		$38.75	$27.61	$66.36
Operators (Building, Class 02A - See Notes)	5/1/2020		$40.30	$28.06	$68.36
Operators (Building, Class 02A - See Notes)	5/1/2021		$41.84	$28.52	$70.36
Operators (Building, Class 03 - See Notes)	5/1/2017		$32.23	$23.68	$55.91
Operators (Building, Class 03 - See Notes)	5/1/2018		$33.78	$24.12	$57.90
Operators (Building, Class 03 - See Notes)	5/1/2019		$33.78	$26.13	$59.91
Operators (Building, Class 03 - See Notes)	5/1/2020		$35.32	$26.59	$61.91
Operators (Building, Class 03 - See Notes)	5/1/2021		$36.87	$27.04	$63.91
Operators (Building, Class 04 - See Notes)	5/1/2017		$30.33	$22.12	$52.45
Operators (Building, Class 04 - See Notes)	5/1/2018		$32.63	$23.80	$56.43
Operators (Building, Class 04 - See Notes)	5/1/2019		$32.63	$25.81	$58.44
Operators (Building, Class 04 - See Notes)	5/1/2020		$34.18	$26.26	$60.44
Operators (Building, Class 04 - See Notes)	5/1/2021		$35.72	$26.72	$62.44
Operators (Building, Class 05 - See Notes)	5/1/2017		$29.87	$21.99	$51.86
Operators (Building, Class 05 - See Notes)	5/1/2018		$32.18	$23.69	$55.87
Operators (Building, Class 05 - See Notes)	5/1/2019		$32.19	$25.67	$57.86
Operators (Building, Class 05 - See Notes)	5/1/2020		$33.73	$26.13	$59.86
Operators (Building, Class 05 - See Notes)	5/1/2021		$35.27	$26.59	$61.86
Operators (Building, Class 06 - See Notes)	5/1/2017		$29.00	$21.72	$50.72
Operators (Building, Class 06 - See Notes)	5/1/2018		$31.31	$23.41	$54.72
Operators (Building, Class 06 - See Notes)	5/1/2019		$31.31	$25.41	$56.72
Operators (Building, Class 06 - See Notes)	5/1/2020		$32.86	$25.86	$58.72
Operators (Building, Class 06 - See Notes)	5/1/2021		$34.40	$26.32	$60.72
Operators (Building, Class 07A- See Notes)	5/1/2017		$42.44	$28.13	$70.57
Operators (Building, Class 07A- See Notes)	5/1/2018		$44.29	$28.68	$72.97
Operators (Building, Class 07A- See Notes)	5/1/2019		$44.60	$30.77	$75.37
Operators (Building, Class 07A- See Notes)	5/1/2020		$46.46	$31.31	$77.77
Operators (Building, Class 07A- See Notes)	5/1/2021		$48.31	$31.86	$80.17
Operators (Building, Class 07B- See Notes)	5/1/2017		$42.09	$28.03	$70.12

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Building, Class 07B- See Notes)	5/1/2018		$43.95	$28.58	$72.53
Operators (Building, Class 07B- See Notes)	5/1/2019		$44.26	$30.66	$74.92
Operators (Building, Class 07B- See Notes)	5/1/2020		$46.11	$31.21	$77.32
Operators (Building, Class 07B- See Notes)	5/1/2021		$47.96	$31.77	$79.73
Painters Class 1 (see notes)	5/1/2017		$27.25	$18.17	$45.42
Painters Class 1 (see notes)	5/1/2019		$28.31	$19.77	$48.08
Painters Class 2 (see notes)	5/1/2017		$30.15	$18.17	$48.32
Painters Class 2 (see notes)	5/1/2019		$31.21	$19.78	$50.99
Painters Class 3 (see notes)	5/1/2017		$36.25	$18.17	$54.42
Plasterers (Use Cement Masons)	5/1/2018		$29.00	$21.30	$50.30
Plasterers	5/1/2017		$24.23	$21.38	$45.61
Plasterers	5/1/2019		$32.08	$21.86	$53.94
Plasterers	5/1/2019		$26.73	$20.63	$47.36
plumber	5/1/2019		$45.92	$31.72	$77.64
Plumbers	5/1/2017		$44.39	$30.60	$74.99
Roofers (Composition)	5/1/2017		$36.15	$30.22	$66.37
Roofers (Composition)	5/1/2018		$37.15	$31.27	$68.42
Roofers (Composition)	5/1/2019		$38.35	$31.80	$70.15
Roofers (Shingle)	5/1/2016		$25.70	$19.17	$44.87
Roofers (Shingle)	5/1/2019		$28.50	$20.87	$49.37
Roofers (Slate & Tile)	5/1/2016		$28.70	$19.17	$47.87
Roofers (Slate & Tile)	5/1/2018		$30.50	$20.37	$50.87
Roofers (Slate & Tile)	5/1/2019		$31.50	$20.87	$52.37
Sheet Metal Workers	6/1/2016		$33.60	$33.43	$67.03
Sheet Metal Workers	6/1/2017		$33.98	$35.40	$69.38
Sheet Metal Workers	6/1/2018		$34.78	$36.45	$71.23
Sheet Metal Workers	6/1/2019		$36.08	$37.65	$73.73
Sprinklerfitters	4/1/2017		$37.40	$21.74	$59.14
Sprinklerfitters	4/1/2018		$38.80	$22.74	$61.54
Steamfitters	5/1/2017		$46.99	$32.67	$79.66
Steamfitters	5/1/2019		$49.93	$35.82	$85.75
Terrazzo Finisher	5/1/2017		$31.64	$15.62	$47.26
Terrazzo Finisher	5/1/2018		$32.35	$15.91	$48.26
Terrazzo Finisher	5/1/2019		$33.04	$16.22	$49.26
Terrazzo Setter	5/1/2017		$30.63	$18.85	$49.48
Terrazzo Setter	5/1/2018		$31.23	$19.25	$50.48
Terrazzo Setter	5/1/2019		$31.81	$19.67	$51.48
Tile & Marble Finisher	5/1/2017		$26.89	$13.86	$40.75
Tile & Marble Finisher	5/1/2018		$27.60	$14.15	$41.75
Tile & Marble Finisher	5/1/2019		$28.29	$14.46	$42.75
Tile & Marble Finisher	5/1/2020		$28.96	$14.79	$43.75
Tile & Marble Finisher	5/1/2021		$29.61	$15.14	$44.75
Tile Setter	5/1/2017		$30.14	$14.75	$44.89
Tile Setter	5/1/2018		$30.76	$15.13	$45.89

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Project: 19-07713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Tile Setter	5/1/2019		$31.37	$15.52	$46.89
Tile Setter	5/1/2020		$31.97	$15.92	$47.89
Tile Setter	5/1/2021		$32.56	$16.33	$48.89
Truckdriver class 1(see notes)	5/1/2017		$34.47	$0.00	$34.47
Truckdriver class 1(see notes)	5/1/2018		$35.32	$0.00	$35.32
Truckdriver class 1(see notes)	5/1/2019		$36.12	$0.00	$36.12
Truckdriver class 2 (see notes)	5/1/2017		$34.54	$0.00	$34.54
Truckdriver class 2 (see notes)	5/1/2018		$35.39	$0.00	$35.39
Truckdriver class 2 (see notes)	5/1/2019		$36.19	$0.00	$36.19
Truckdriver class 3 (see notes)	5/1/2017		$35.03	$0.00	$35.03
Truckdriver class 3 (see notes)	5/1/2018		$35.88	$0.00	$35.88
Truckdriver class 3 (see notes)	5/1/2019		$36.68	$0.00	$36.68

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	$36.88	$15.49	$52.37
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020	4/30/2021	$39.12	$15.49	$54.61
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		$41.42	$15.49	$56.91
Carpenter - Instrument Person (Surveying & Layout)	5/1/2016		$27.12	$13.83	$40.95
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	$32.07	$15.49	$47.56
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020	4/30/2021	$34.02	$15.49	$49.51
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		$36.02	$15.49	$51.51
Carpenter - Rodman I (Survey & Layout)	5/1/2016		$21.09	$13.83	$34.92
Carpenter - Rodman I (Survey & Layout)	5/1/2019	4/30/2020	$25.66	$12.39	$38.05
Carpenter - Rodman I (Survey & Layout)	5/1/2020	4/30/2021	$27.22	$12.39	$39.61
Carpenter - Rodman I (Survey & Layout)	5/1/2021		$28.82	$12.39	$41.21
Carpenter - Rodman II (Survey & Layout)	5/1/2016		$18.69	$13.83	$32.52
Carpenter	5/1/2019	4/30/2020	$32.07	$15.49	$47.56
Carpenter	5/1/2020	4/30/2021	$34.02	$15.49	$49.51
Carpenter	5/1/2021		$36.02	$15.49	$51.51
Carpenters	6/1/2017		$30.92	$14.14	$45.06
Cement Finishers	1/1/2017		$27.70	$20.20	$47.90
Electric Lineman	5/29/2017		$44.22	$23.94	$68.16
Electric Lineman	5/28/2018		$45.25	$24.94	$70.19
Electric Lineman	5/27/2019		$46.32	$25.97	$72.29
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2017		$31.33	$28.42	$59.75
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2018		$32.53	$28.42	$60.95
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2019		$32.76	$29.88	$62.64
Iron Workers	7/1/2106		$31.95	$27.65	$59.60
Laborers (Class 01 - See notes)	5/1/2016		$19.81	$15.79	$35.60
Laborers (Class 01 - See notes)	5/1/2017		$20.36	$16.29	$36.65
Laborers (Class 01 - See notes)	5/1/2018		$20.96	$16.79	$37.75
Laborers (Class 01 - See notes)	5/1/2019		$21.61	$17.29	$38.90
Laborers (Class 02 - See notes)	5/1/2016		$26.43	$15.79	$42.22
Laborers (Class 02 - See notes)	5/1/2017		$26.98	$16.29	$43.27
Laborers (Class 02 - See notes)	5/1/2018		$27.58	$16.79	$44.37
Laborers (Class 02 - See notes)	5/1/2019		$28.23	$17.29	$45.52
Laborers (Class 03 - See notes)	5/1/2016		$23.42	$15.79	$39.21
Laborers (Class 03 - See notes)	5/1/2017		$23.97	$16.29	$40.26
Laborers (Class 03 - See notes)	5/1/2018		$24.57	$16.79	$41.36
Laborers (Class 03 - See notes)	5/1/2019		$25.22	$17.29	$42.51
Laborers (Class 04 - See notes)	5/1/2016		$23.77	$15.79	$39.56
Laborers (Class 04 - See notes)	5/1/2017		$24.32	$16.29	$40.61
Laborers (Class 04 - See notes)	5/1/2018		$24.92	$16.79	$41.71
Laborers (Class 04 - See notes)	5/1/2019		$25.57	$17.29	$42.86
Laborers (Class 05 - See notes)	5/1/2016		$24.44	$15.79	$40.23
Laborers (Class 05 - See notes)	5/1/2017		$24.99	$16.29	$41.28

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PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 05 - See notes)	5/1/2018		$25.59	$16.79	$42.38
Laborers (Class 05 - See notes)	5/1/2019		$26.24	$17.29	$43.53
Laborers (Class 06 - See notes)	5/1/2016		$23.86	$15.79	$39.65
Laborers (Class 06 - See notes)	5/1/2017		$24.41	$16.29	$40.70
Laborers (Class 06 - See notes)	5/1/2018		$25.01	$16.79	$41.80
Laborers (Class 06 - See notes)	5/1/2019		$25.66	$17.29	$42.95
Laborers (Class 07 - See notes)	5/1/2016		$24.15	$15.79	$39.94
Laborers (Class 07 - See notes)	5/1/2017		$24.70	$16.29	$40.99
Laborers (Class 07 - See notes)	5/1/2018		$25.30	$16.79	$42.09
Laborers (Class 07 - See notes)	5/1/2019		$25.95	$17.29	$43.24
Laborers (Class 08 - See notes)	5/1/2016		$24.63	$15.79	$40.42
Laborers (Class 08 - See notes)	5/1/2017		$25.18	$16.29	$41.47
Laborers (Class 08 - See notes)	5/1/2018		$25.78	$16.79	$42.57
Laborers (Class 08 - See notes)	5/1/2019		$26.43	$17.29	$43.72
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2016		$32.16	$22.64	$54.80
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2017		$33.80	$24.16	$57.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2018		$35.35	$24.61	$59.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2019		$35.35	$26.61	$61.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2020		$36.90	$27.06	$63.96
Operators (Building/Heavy, Class 01 - See Notes)	5/1/2021		$38.44	$27.52	$65.96
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2017		$36.05	$24.82	$60.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2018		$37.60	$25.27	$62.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2019		$37.60	$27.27	$64.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2020		$39.14	$27.73	$66.87
Operators (Building/Heavy, Class 01a - See Notes)	5/1/2021		$40.69	$28.18	$68.87
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2017		$33.52	$24.07	$57.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2018		$35.07	$24.52	$59.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2019		$35.07	$26.52	$61.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2020		$36.61	$26.98	$63.59
Operators (Building/Heavy, Class 02 - See Notes)	5/1/2021		$38.16	$27.43	$65.59
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2017		$35.78	$24.72	$60.50
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2018		$37.32	$25.19	$62.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2019		$37.32	$27.19	$64.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2020		$38.87	$27.64	$66.51
Operators (Building/Heavy, Class 02a - See Notes)	5/1/2021		$40.41	$28.10	$68.51
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2017		$30.60	$23.21	$53.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2018		$32.15	$23.66	$55.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2019		$32.15	$25.66	$57.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2020		$33.69	$26.12	$59.81
Operators (Building/Heavy, Class 03 - See Notes)	5/1/2021		$35.24	$26.57	$61.81
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2017		$29.47	$22.88	$52.35
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2018		$31.01	$23.32	$54.33
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2019		$31.01	$25.33	$56.34
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2020		$32.55	$25.79	$58.34

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PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Building/Heavy, Class 04 - See Notes)	5/1/2021		$34.10	$26.24	$60.34
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2017		$29.02	$22.74	$51.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2018		$30.56	$23.20	$53.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2019		$30.56	$25.20	$55.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2020		$32.11	$25.65	$57.76
Operators (Building/Heavy, Class 05 - See Notes)	5/1/2021		$33.65	$26.11	$59.76
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2017		$28.14	$22.49	$50.63
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2018		$29.68	$22.93	$52.61
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2019		$29.68	$24.94	$54.62
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2020		$31.23	$25.39	$56.62
Operators (Building/Heavy, Class 06 - See Notes)	5/1/2021		$32.77	$25.84	$58.61
Operators (Class 02 - All Types of Cranes, Backhoes, Shovels)	5/1/2019		$33.29	$25.99	$59.28
Operators (Heavy, Class 07A - See Notes)	5/1/2017		$40.73	$27.63	$68.36
Operators (Heavy, Class 07A - See Notes)	5/1/2018		$42.58	$28.18	$70.76
Operators (Heavy, Class 07A - See Notes)	5/1/2019		$42.89	$30.27	$73.16
Operators (Heavy, Class 07A - See Notes)	5/1/2020		$44.74	$30.82	$75.56
Operators (Heavy, Class 07A - See Notes)	5/1/2021		$46.59	$31.37	$77.96
Operators (Heavy, Class 07B - See Notes)	5/1/2017		$40.38	$27.53	$67.91
Operators (Heavy, Class 07B - See Notes)	5/1/2018		$42.23	$28.09	$70.32
Operators (Heavy, Class 07B - See Notes)	5/1/2019		$42.54	$30.17	$72.71
Operators (Heavy, Class 07B - See Notes)	5/1/2020		$44.39	$30.72	$75.11
Operators (Heavy, Class 07B - See Notes)	5/1/2021		$46.25	$31.26	$77.51
Operators (Highway, Class 01 - See Notes)	5/1/2016		$32.16	$22.64	$54.80
Operators (Highway, Class 01 - See Notes)	5/1/2017		$32.93	$23.87	$56.80
Operators (Highway, Class 01 - See Notes)	5/1/2018		$34.47	$24.33	$58.80
Operators (Highway, Class 01 - See Notes)	5/1/2019		$34.47	$26.33	$60.80
Operators (Highway, Class 01 - See Notes)	5/1/2020		$37.56	$25.24	$62.80
Operators (Highway, Class 01 - See Notes)	5/1/2021		$39.10	$25.70	$64.80
Operators (Highway, Class 01a - See Notes)	5/1/2017		$35.18	$24.56	$59.74
Operators (Highway, Class 01a - See Notes)	5/1/2018		$36.72	$25.01	$61.73
Operators (Highway, Class 01a - See Notes)	5/1/2019		$36.72	$27.01	$63.73
Operators (Highway, Class 01a - See Notes)	5/1/2020		$39.81	$25.92	$65.73
Operators (Highway, Class 01a - See Notes)	5/1/2021		$41.35	$26.38	$67.73
Operators (Highway, Class 02 - See Notes)	5/1/2016		$30.98	$22.31	$53.29
Operators (Highway, Class 02 - See Notes)	5/1/2017		$31.75	$23.53	$55.28
Operators (Highway, Class 02 - See Notes)	5/1/2018		$33.30	$23.98	$57.28
Operators (Highway, Class 02 - See Notes)	5/1/2019		$33.29	$25.99	$59.28
Operators (Highway, Class 02 - See Notes)	5/1/2020		$36.38	$24.90	$61.28
Operators (Highway, Class 02 - See Notes)	5/1/2021		$37.93	$25.35	$63.28
Operators (Highway, Class 03 - See Notes)	5/1/2016		$30.28	$22.10	$52.38
Operators (Highway, Class 03 - See Notes)	5/1/2017		$31.06	$23.32	$54.38
Operators (Highway, Class 03 - See Notes)	5/1/2018		$32.59	$23.80	$56.39
Operators (Highway, Class 03 - See Notes)	5/1/2019		$32.59	$25.79	$58.38
Operators (Highway, Class 03 - See Notes)	5/1/2020		$35.69	$24.69	$60.38

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Operators (Highway, Class 03 - See Notes)	5/1/2021		$37.23	$25.16	$62.39
Operators (Highway, Class 04 - See Notes)	5/1/2016		$29.82	$21.98	$51.80
Operators (Highway, Class 04 - See Notes)	5/1/2017		$30.60	$23.20	$53.80
Operators (Highway, Class 04 - See Notes)	5/1/2018		$32.14	$23.66	$55.80
Operators (Highway, Class 04 - See Notes)	5/1/2019		$32.14	$25.66	$57.80
Operators (Highway, Class 04 - See Notes)	5/1/2020		$35.23	$24.57	$59.80
Operators (Highway, Class 04 - See Notes)	5/1/2021		$36.77	$25.03	$61.80
Operators (Highway, Class 05 - See Notes)	5/1/2016		$29.31	$21.83	$51.14
Operators (Highway, Class 05 - See Notes)	5/1/2017		$30.08	$23.06	$53.14
Operators (Highway, Class 05 - See Notes)	5/1/2018		$31.63	$23.51	$55.14
Operators (Highway, Class 05 - See Notes)	5/1/2019		$31.63	$25.51	$57.14
Operators (Highway, Class 05 - See Notes)	5/1/2020		$34.72	$24.42	$59.14
Operators (Highway, Class 05 - See Notes)	5/1/2021		$36.26	$24.87	$61.13
Operators (Highway, Class 06 - See Notes)	5/1/2016		$32.40	$22.70	$55.10
Operators (Highway, Class 06 - See Notes)	5/1/2017		$33.17	$23.94	$57.11
Operators (Highway, Class 06 - See Notes)	5/1/2018		$34.71	$24.39	$59.10
Operators (Highway, Class 06 - See Notes)	5/1/2019		$34.71	$26.39	$61.10
Operators (Highway, Class 06 - See Notes)	5/1/2020		$37.79	$25.30	$63.09
Operators (Highway, Class 06 - See Notes)	5/1/2021		$39.33	$25.78	$65.11
Operators (Highway, Class 06/A - See Notes)	5/1/2016		$34.65	$23.36	$58.01
Operators (Highway, Class 06/A - See Notes)	5/1/2017		$35.42	$24.59	$60.01
Operators (Highway, Class 06/A - See Notes)	5/1/2018		$36.96	$25.05	$62.01
Operators (Highway, Class 06/A - See Notes)	5/1/2019		$36.96	$27.05	$64.01
Operators (Highway, Class 06/A - See Notes)	5/1/2020		$40.04	$25.97	$66.01
Operators (Highway, Class 06/A - See Notes)	5/1/2021		$41.58	$26.43	$68.01
Operators (Highway, Class 07/A - See Notes)	5/1/2016		$38.56	$25.99	$64.55
Operators (Highway, Class 07/A - See Notes)	5/1/2017		$39.66	$27.31	$66.97
Operators (Highway, Class 07/A - See Notes)	5/1/2018		$41.52	$27.84	$69.36
Operators (Highway, Class 07/A - See Notes)	5/1/2019		$41.82	$29.95	$71.77
Operators (Highway, Class 07/A - See Notes)	5/1/2020		$45.23	$28.94	$74.17
Operators (Highway, Class 07/A - See Notes)	5/1/2021		$47.08	$29.49	$76.57
Operators (Highway, Class 07/B - See Notes)	5/1/2016		$37.17	$25.57	$62.74
Operators (Highway, Class 07/B - See Notes)	5/1/2017		$38.25	$26.89	$65.14
Operators (Highway, Class 07/B - See Notes)	5/1/2018		$40.10	$27.44	$67.54
Operators (Highway, Class 07/B - See Notes)	5/1/2019		$40.41	$29.53	$69.94
Operators (Highway, Class 07/B - See Notes)	5/1/2020		$43.81	$28.53	$72.34
Operators (Highway, Class 07/B - See Notes)	5/1/2021		$45.66	$29.08	$74.74
Painters Class 3 (see notes)	5/1/2019		$37.31	$19.78	$57.09
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2017		$40.98	$32.53	$73.51
Truckdriver class 1(see notes)	5/1/2016		$33.57	$0.00	$33.57
Truckdriver class 1(see notes)	5/1/2017		$34.47	$0.00	$34.47
Truckdriver class 1(see notes)	5/1/2018		$35.32	$0.00	$35.32
Truckdriver class 1(see notes)	5/1/2019		$36.12	$0.00	$36.12
Truckdriver class 2 (see notes)	5/1/2016		$33.64	$0.00	$33.64

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 19-07713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Truckdriver class 2 (see notes)	5/1/2017		$34.54	$0.00	$34.54
Truckdriver class 2 (see notes)	5/1/2018		$35.39	$0.00	$35.39
Truckdriver class 2 (see notes)	5/1/2019		$36.19	$0.00	$36.19
Truckdriver class 3 (see notes)	5/1/2016		$34.13	$0.00	$34.13
Truckdriver class 3 (see notes)	5/1/2017		$35.03	$0.00	$35.03
Truckdriver class 3 (see notes)	5/1/2018		$35.88	$0.00	$35.88
Truckdriver class 3 (see notes)	5/1/2019		$36.68	$0.00	$36.68